The STORY of CORN

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THE STORY OF CORN AND THE WESTWARD MIGRATION

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THE PREFACE

The struggle of the human race for food has been and still is one of the great factors in the growth of civilization. Histories tell us of the progress of social institutions. Geographies analyze the world's food supply and describe in detail the areas that are most productive. Books on agriculture give us a study of the food plants and the best methods of securing the greatest returns from the land. But none of these texts makes it sufficiently clear to the youth of the country that the improvement in food plants and the productivity of the land are among the greatest factors in the building of a civilization.

The purpose of *The Story of Corn* is to combine certain fundamental principles of geography and agriculture and treat them historically in order that the youth may appreciate the tremendous importance of agriculture in the history of the race. A complete history of agriculture would make a volume too large and too technical for grammar-grade or high-school pupils. Therefore the cereals, with special emphasis on Indian corn, have been chosen as the theme for this book.

The Story of Corn is a story of the struggle of the human race for food. Primitive people deified the natural forces that produced the food. When man relied on only one cereal, famines were frequent. But the discovery of America gave to the world a new cereal, maize or Indian corn, and since that time famines among civilized people have grown less and less frequent, until to-day they are practically unknown in civilized countries. This new cereal, Indian corn, sustained the first settlers

in their attempts to build homes in the New World, and as the settlers moved westward, it was Indian corn that drew them to the new lands and supported them while they opened the great states beyond the mountains. The upper Mississippi Valley, then, became the world's granary, and Chicago the greatest food market in the world.

The grain of the West stimulated the demand for better communication, and internal improvements became a great national issue. Highways, canals, steamboats, and railroads were built to connect the East and the West in order that the grain and grain products might reach the markets of the East. In this way the corn of America affected the politics of the United States; and to-day this nation employs a great army of people to study how to increase the food supply of the country in order that the people may continue to prosper.

The heroic tale to be found in *The Story of Corn* should be exceedingly profitable to the youth of the country, for it enables them to understand somewhat the widespread power of the man who produces the world's food.

The Story of Corn is a companion book to *The Story of Cotton*, and the two should make a good course in elementary economic history for the last year of the grammar school or the first year of the high school.

In the preparation of this book, thanks are due especially to the United States Department of Agriculture, to W. K. Boyd, Professor of American History, and W. T. Laprade, Professor of European History, Trinity College, Durham, N. C.

EUGENE C. BROOKS

Durham, North Carolina

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Photograph by King Prints Co.

A modern American silo, in which corn is stored for use as food for stock

THE STORY OF CORN AND THE WESTWARD MIGRATION

CHAPTER I

The Struggle for Food

The Feeding Instinct. The first instinct of every being is to secure food for the needs of its body. The moment any living thing appears in the world it begins to feel about for food. The infant animal makes its wants known by signs, and the little plant begins to send its tiny rootlets around in the soil. The body is extremely sensitive to the pangs of hunger, and responds more readily to its call than to any other stimulus.

When the body is insufficiently nourished, both the mind and the body become abnormal. The child in the schoolroom is unable to respond to the demands of the teacher; the statesman is unable to hold firmly the reins of government; and the laborer in the fields, in the store, or in the factory is unable to render efficient service. When the weakening organs begin to call for support, and the life currents draw heavily on the stored-up energy of the body, all the native habits of the individual are greatly exaggerated or undergo a

sudden change. In the lower animals, whether we consider the common earthworm or the monarch of the forest, the effect is the same; and among the races of men, whether we consider the most bestial cannibal that feeds on the captives taken in war or the most exalted ruler in the universe, the instinct is still the same. Hunger would turn a king into a savage; it can take away a mother's love and drive her to feed on her child; it sometimes fills the slums of our cities with thieves and thugs, makes null and void all law and order, and turns men into demons. Therefore the feeding instinct is one of the great motive powers that drive all life and that make all living things active. How to secure sufficient and wholesome food is a problem that confronts every individual. It is the chief concern of every family, and the prosperity of the home depends upon the ease with which its food may be secured and prepared.

This problem of securing food is one of the leading subjects discussed in our legislative halls, since it affects labor conditions, commerce, and international relations. Indeed, the struggle for food has been one of the determining factors in the development of the social institutions, and it is to-day a subject that concerns the average man in the morning when he begins his daily toil as well as in the evening when he lays aside the cares of the day for his needed rest.

Relation of Food to the Body. To be intensely hungry is a violation of a fundamental law of life.

Therefore nature has endowed all animals, the worm as well as the lion, with complete organs for securing food. The dog, the fox, the cat, and other animals of their kind have a keen scent which leads them to food; the hog has a stout nose for rooting, the chicken long claws for scratching, the wolf dangerous fangs for tearing its prey to pieces. In short, every animal, according to its nature, is endowed with the means for providing itself with food. There are many different kinds of animals, and in many cases one kind feeds upon another. Therefore, in the bodily structure of each are found organs for fighting, or for escaping a natural enemy. The deer has fleet feet, the bird has swift wings, the porcupine has prickly quills, the stag has antlers, the horse has strong legs, while the lion's strength makes him king of beasts.

The structure of an animal determines in a measure the nature and kind of food it must have. In all this struggle for food some animals, like the deer or horse, depend upon roots, herbs, leaves, and grasses, while others, like the lion and tiger, feed upon other animals. But in either case they take the food in its raw state and eat it as nature provides it. The beast of the forest takes little thought for the morrow. He eats of what he finds to-day until the body is satisfied; then much of his vicious nature disappears and he lazily drowses his time away until the pangs of hunger begin to reappear and drive him forth again. He is unable to provide for the future, and hunger is at the same time his greatest enemy

and his greatest stimulus to action. Animals, such as the wolf, the tiger, and the lion, that live chiefly

Courtesy of Field Museum, Chicago

A Pygmy home in the Philippines. By many students the Pygmy people are thought to be more like the primitive man than any other existing race

on the flesh of other animals are usually more vicious than those living on vegetable food.

We are not able to prove conclusively that certain kinds of food produce traits of character alike in man and beast. But, nevertheless, wherever man roams wild, naked in body save for the coarse hair that covers him, and digs in marshy places for roots which he eats raw, he would certainly seem to be not so far removed from the animal that has similar tastes and habits. The primitive man who

prowled around, club in hand, and who slept in caves, was no doubt a being superior to the bear or lion. Yet we are told that he fed on raw meat and drank blood, and that he could tear his enemy's heart out and eat it raw. He does not, therefore, appear to have been far removed in character from lions or tigers that lay in wait for their prey and tore their victims limb from limb, and, after feeding on the flesh until the stomach was full, lapped up the blood and strolled lazily away. Consequently we seem to be justified in concluding that the character of an animal is in a great measure shaped by its food.

The Story of Prometheus and Epimetheus. The superiority of man over the lower animals is well illustrated by the story of Prometheus and Epimetheus as told by Plato:

"Once upon a time there were gods only, and no mortal creatures. But when the time came that animals should also be created, the gods fashioned them out of earth and fire and various mixtures; but when they were about to bring them into the light of day, they ordered Prometheus and Epimetheus to equip them, and to distribute to them severally their proper qualities. Epimetheus said to Prometheus:

"'Let me distribute, and do you inspect.'

"This was agreed, and Epimetheus made the distribution. There were some to whom he gave strength without swiftness, or again swiftness without strength; some he armed and others he left unarmed; and devised for the latter some other means for preservation, making some large, and

having their size as a protection, and others small, whose nature was to fly in the air or burrow in the ground. This was to be their way of escape. Thus did he compensate them with the view to preventing any race from becoming extinct. And when he had provided against their destruction by one another, he contrived also a means of protecting them against the seasons; clothing them with coarse hair and thick skins sufficient for defending them from the cold and heat, and for a natural bed of their own when they wanted to rest. He furnished them also with hoofs and hair and hard and callous skins under their feet. Then he gave them varieties of food—to some herbs of the soil, to others fruits of the trees, and to others, roots; and to some again he gave other animals as food. In this way the race was preserved.

"Epimetheus, however, not being very wise, forgot that he had distributed among the brute animals all the qualities that he had to give, and when he came to man, who was still unprovided, he was terribly perplexed. Now, while he was in his perplexity, Prometheus came to inspect the distribution, and he found that the other animals were suitably furnished, but that man alone was naked and shoeless and had neither bed nor means of defense. The appointed hour was approaching in which man was to go forth into the light of day; and Prometheus, not knowing how he could devise man's salvation, stole from the gods fire and the art of working in metals, and gave to him the foresight and wisdom necessary to the support of life."

Plato wrote this story to teach the Greeks that man has the wisdom to change all things around him and the foresight to store up for the future, but that the lower animals must use without change what they can find in nature. The animal walks always with his face toward the earth, looking for what is prepared by nature for his use; but man walks always erect, with his head up, looking beyond himself.

Wisdom and Foresight developed slowly. Since in his daily life man differs from the lower animals according to the amount of wisdom he displays, it is interesting to study different people and their characteristics—their manner of life, the food they eat, the foresight they display, and the wisdom they use in securing and preparing food. There are races of men so much like the lower animals that they labor only so long as they are hungry or uncomfortable. In Africa and South America certain very primitive races live more like beasts than men. They roam about from place to place, sleeping in tents, caves, or thick underbrush. They feed chiefly on roots, fruit, snails, grasshoppers, and ants. They have few cooking utensils; a stone, or a hole in the ground, is all they need. They gorge themselves and then sleep until hunger calls them again to action. They have little foresight and less wisdom. The finer human characteristics have not yet been developed in them, and their habits in many respects are more like those of the beasts.

The North American Indian progressed farther

than these men. The Indian possessed some of the gifts of Prometheus. He had learned the art of

Photograph by Rau

The Bedouins of Algeria still lead a wandering life, driving their cattle from place to place in search of pasture. Though superior to the primitive man, from generation to generation they are but little more civilized than their ancestors

making superior weapons; he had stone mortars for grinding his grain; he knew how to dry his meat in order to preserve it for use later; he had learned to bury his grain in the ground and wait for it to bring forth again; he had learned to lay up the unused portions of his food for future use. There was coöperation in the home: the fathers and sons went hunting and fishing to secure the animal food, while the mothers and daughters cultivated the patches around

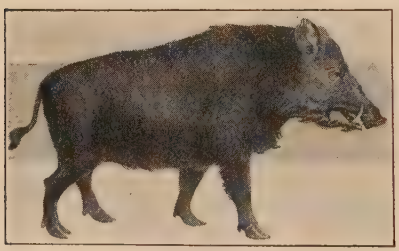
the wigwams and thus provided the vegetable food.

It is quite probable that women invented agriculture, and were the first to understand the art of sowing and reaping.

Among primitive people wild animals were taken captive for food. When there was more food than was needed for immediate use the live animal was probably kept in captivity until the previous supply was exhausted. Gradually the captive animal lost its wild nature, and thus was developed our first domestic animal, perhaps the dog. In the cultivation of the soil, the women were governed in their selection of food by the native food plants in their community, and by the ease with which that food could be preserved for future use. While the men were domesticating animals and thereby learning to provide food for times when they could not engage in hunting, the women were learning how to cultivate the land and to reap more than they had sown, and to lay the surplus away for time of need. In this way mankind received the gifts of Prometheus.

How Man made the Animals help him. We have already seen that certain tribes of men were little better than the beasts of the forest. It was not until man learned to provide a fixed home and to take better care of his family that he showed himself greatly superior to the beast. When home life began, family ties were strengthened, love for the different members of the family increased, and all the finer attributes began to develop.

But man needed helpers in his struggle with the outside world, and so did the animals of the forest. Man had wisdom and foresight; animals had physical strength. Man needed the animals, and they needed man. But before man learned the value of different animals it is quite probable that he used them only for food. The dog, at first used as a food, later learned to aid man in capturing other animals, and gradually ceased to be looked upon as a food. Instead it became an important factor in securing food. The horse and the camel were also probably used for food at first, but on account of their superior strength they became beasts of burden,—the means of securing food, and aids in fighting the enemies of the tribe. The sheep, the goat, and the cow were also domesticated, to be eaten in time of need. These animals were of double value to man, for their milk was a wholesome food and could be preserved in the form of butter and cheese, and the hair or hides could be converted into clothing; besides, they could also be used like the horse, as beasts of burden. But man did not stop here. He went into the forest and caught the wild hog, tamed it, and improved the quality of its flesh, until it has become



From "The Tree Dwellers"

The wild hog of the forest, tamed, and fed upon cereals, has developed into the domesticated hog

a very important food to-day. The fowls of the air were likewise domesticated. The hen, the goose, the duck, the turkey, the pigeon, and the peacock gave their eggs and their flesh for food and their feathers for bedding and even for clothing.

Thus man continued to rise superior to the beasts of the forest and the fowls of the air. They contributed to his needs; but, as they did so, man's wisdom had to be increased in order that he might provide food for them also, and preserve them so that they might be of more value to him. One must help the other, and the value of the domestic animals is determined by the care man takes of them. In providing food for them it was discovered that the hard cereals that had already been found so valuable to man made the best food for his domestic animals. Therefore the cereals became the chief food of both man and beast.

The Corn of the World. The term "corn" is applied in agriculture to the seed of the cereal plants. The word is often understood locally to mean that kind of cereal which is the leading crop of the district, and it may be wheat, barley, oats, maize (Indian corn), rye, millet, or even rice. It is written in Genesis: "And all countries came into Egypt to Joseph to buy corn; because the famine was sore in the land." The grain mentioned in this quotation was probably wheat. Ruth gleaned ears of corn in the barley fields of Boaz, while in Pharaoh's wonderful dream the seven good ears of corn that devoured the seven thin and blasted ears were

probably ears of wheat. Again, in Roman history we read of a great popular uprising because bread was scarce, and the Gracchi became great tribunes of the people because they advocated more favorable corn laws. The grain referred to then was wheat. Rice is the corn of China and Japan, rye of northern Europe, oats of Scotland, and wheat of England. In America an ear of corn means an ear of maize, or Indian corn, the national grain of our country.

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A housewife of the Ecuador highlands grinding oats for bread. Oats, originally the grain food of Europe, is still the "corn" of Scotland

It was natural that the cereals should become the source of all our bread. They can be preserved easily, while tubers and fruits soon decay. Wheat, barley, oats, Indian corn, millet, and rye, if properly cared for, remain for the most part unhurt by cold, heat, dryness, or dampness. Hence their great value to the world.

The Value of Corn. In the earlier ages a man's wealth was measured by the number of his domestic animals. But in order to care for them as well as for himself it was necessary for him to store up enough food in the harvest season to last until the harvest came again. Therefore, as the size of the family and the number of domestic animals increased, how to secure food became a greater and greater problem. Man had to stop his wandering life and make the land increase its yield. But cultivating the soil requires time, labor, and patience. The stronger domestic animals, such as the horse, the ox, and the camel, were trained to work in the field. Man's wisdom and foresight increased, and he began to observe the seasons and note their influence on the soil, the plant, and the health of his family. He learned to plan and plant, and wait for results. He built a home for his family and shelters for his animals; he measured the boundaries of his own land and became king of the earth.

As his foresight developed, more and more cereals were produced. With them man has been able to make the wild hogs beg food at his hands. Geese and ducks, no longer wild, call for their

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The cereal-producing areas of the world

portion as the sun rises and sets. His sheep and goats, his cows and horses, all acknowledge him their lord and master. By owning the land and controlling the products thereof he controls the food, clothing, and shelter of mankind. Thus it was natural that those who controlled the land should become, on account of their wisdom, kings of men and lords of the land, or landlords. How man rose to this lordship is a long story, and one full of the greatest interest.

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Plowing in the valley of Ajalon, Palestine. The ox, one of the first animals trained to work in the fields, still performs its humble tasks for man in many regions of the world

CHAPTER II

Mythical Stories of Our Food-Giving Plants

The Mystery of Life. "The earth is the mother of all, and the stones are her bones," said the ancients, and those who understood only partly the strange processes going on in the earth were considered the wisest of men. In fact, primitive peoples in all ages have had the notion that this strange process, seen in the growth and fruitage of the plants, is controlled by special gods, and we find many strange religious customs associated with cultivating the plants and harvesting the grain. So important were the coming and going of the seasons, and so regular were they in obeying some mysterious law, that earlier peoples felt instinctively that the seasons were also controlled by special deities, probably in many instances the same as those directing the growth of the plant. Therefore, much of the religion of the people in ancient times was given to the worship of the deities that made the plant to grow and the grain to ripen.

Although in those early ages man did not know how to make the soil increase its yield, he did observe that the river valleys were the most fertile parts of the earth. Therefore, the great civilizations of ancient times were always located in the great river valleys. Here resided the gods who controlled

the seasons and directed the growth of the food-giving plants. In studying the most renowned river valleys of the East, such as the Ganges, the Euphrates, or the Nile, or the great valleys of North and South America, such as the Mississippi and La Plata, we discover that the ancient races worshiped special deities who were supposed to watch over the growing grain, and that they had strange ceremonies to celebrate the sowing and the harvesting of grain. These facts show how intimately the religions of these people were associated with the cultivation of the soil. The Hebrews alone had one God, Jehovah. He was an all-wise father who guided them in their sowing and reaping as well as in their sickness and health.

The Egyptian Myth: Isis and Osiris. One of the oldest civilizations of the world was located on the banks of the Nile River near its mouth. This river takes its rise beyond the vast desert that stretches far to the southward, and flows for many hundreds of miles through a barren, burning waste of sand, bringing a tremendous volume of water to refresh the lowlands near its mouth. This in itself was a great mystery. Periodically, as if guided by the hand of some deity, this mighty river rises and swells its bosom until its waters overflow its banks and spread far out, miles and miles from its bed. This periodical overflow brings to the lower valley sufficient water for the production of food in plenty. As it is to-day, so it was in the days of Joseph and the Pharaohs; and since all life was supported by

the Nile, the religion of the Egyptians was always associated with that river.

In the mythology of Egypt there is a story to the effect that the crystal springs of the Nile bubble up in the garden of Paradise, the home of the gods. Then, wandering through lovely meadows, the infant stream finally expands into the lordly and majestic river which offers life and plenty to the world. The overflow of this great river is hailed to-day with shouts of joy and thanksgiving, for its waters cover the fields that bring forth grain in plenty. Thus it was also when Jacob's sons went down into Egypt to buy corn.

The god Osiris, the greatest deity of the Egyptians, controlled the flow of the Nile and was universally worshiped in Egypt. He was worshiped likewise in other countries, whose people came down into Egypt to buy corn, for he had his home in the garden of Paradise and sent the water down into the burning desert that the people might have corn.

But, according to the mythology of Egypt, Osiris was murdered one day. The Nile was thereupon still, and the waters refused to overflow the banks. There was famine in the land. Isis, the wife of Osiris and queen of Paradise, hearing of the death of her husband, sought his remains in the great river whose waters were silent, mourning for his death. When the body was found Isis was overcome with grief. But as her tears began to fall the river began to rise and the waters again began to overflow the banks. It was Isis, the goddess of

heaven, who had caused the water to come again and the famine to cease; therefore Isis was worshiped as the immediate cause of the Nile's overflow and of the people's prosperity. On the monuments she is called the goddess mother, the mistress of heaven, the eye of the sun, and the queen of the gods.

The Greek and Roman Myth: Ceres and Proserpine, The Greek goddess of seed and harvest was Demeter, who presided over the sowing, reaping, and grinding of corn. The Romans worshiped Ceres, who was the creator of food for man. When the Greeks settled in Italy and associated with the Romans they adopted Ceres as their goddess, but gave to her many of the mythological incidents which originated with Demeter. These stories were believed by both Greeks and Romans. The most noted of these is the story of Ceres and Proserpine.

From a painting in Pompeii

Ceres, the goddess of seed and harvest

The Greeks and Romans believed that Ceres, during July and August, was driving over the earth caring for the growing plants, and that during the

month of September she was ripening the fruit and making the fields yellow with nodding heads of golden grain. These ancient peoples believed that formerly plants had grown and ripened all the year round; but one day while Ceres was caring for the ripening grain and fruits over the earth, her daughter Proserpine, a young woman of great beauty, was seized by Pluto, the god of the lower regions, who carried her to his home in Hades. When Ceres returned home she was stricken with grief, and over the whole earth she drove her chariot, calling upon all things to help her in her search, but in vain. Then in her great grief the goddess refused to allow the grain to grow and to ripen, and there was famine in all the world.

Jupiter, however, seeing the great distress below, sent Mercury, the wing-footed messenger of the gods, to Pluto, commanding him to release Proserpine. She was restored to her mother, and there was great rejoicing in all the earth. Vegetation at once began to take on a new life, and the grain began again to grow and the fruit to ripen. But when Ceres saw her daughter she feared one thing —that she had eaten food in Pluto's kingdom. She questioned Proserpine, who replied that she had eaten only some pomegranate seeds.

"Alas!" cried Ceres, "you must remain with Pluto in the realm of darkness one half of your time."

Thus the seasons are accounted for. While Proserpine is with Pluto, Ceres is sad and there is no vegetation and it is winter. But when mother and

daughter are together the earth is covered with the gifts of Ceres, and it is summer throughout the world.

The Indian Myth: Mondamin and Hiawatha. It is well known that the bread of the Indian came from maize, or Indian corn. The story of Mondamin as told in *Hiawatha* is the Indian myth of the origin of maize. When Hiawatha was a little

From Hiawatha "Industrial Reader."

Then the ripened ears he gathered,
Gave the first Feast of Mondamin

boy, he lived in a beautiful country near the "Big Sea Water." It was customary for all Indian boys, when approaching manhood, to fast for several days in order that the Great Spirit might tell them what spirit would be their guide through life. Therefore when it came time for Hiawatha to go through his season of fasting he went far away into the forest, and there alone he built his wigwam and began his fasting. Late in the afternoon of the fourth day of his fasting he was faint and weak, and as he lay on the floor of his wigwam a beautiful youth in garments of greens and yellows of many shades, with green plumes in his yellow hair, came and stood before him and spoke to him:

" 'From the Master of Life descending,
I, the friend of man, Mondamin,
Come to warn you and instruct you,
How by struggle and by labor
You shall gain what you have prayed for.
Rise up from your bed of branches,
Rise, O youth, and wrestle with me!' "

Hiawatha arose at once and began wrestling with Mondamin, and as he wrestled Hiawatha grew stronger. But when the sun went down the contest ended, and Mondamin said he would return the following day. For three days they wrestled, and each day Hiawatha grew stronger, until at the end of the third contest Mondamin cried:

" 'O Hiawatha!
Bravely have you wrestled with me,
Thrice have wrestled stoutly with me,
And the Master of Life, who sees us,
He will give to you the triumph!

. . . To-morrow
Is the last day of your conflict,
Is the last day of your fasting.
You will conquer and o'ercome me;
Make a bed for me to lie in,
Where the rain may fall upon me,
Where the sun may come and warm me;
Strip these garments, green and yellow,
Strip this nodding plumage from me,
Lay me in the earth, and make it
Soft and loose and light above me.
Let no hand disturb my slumber,
Let no weed nor worm molest me,
Let not Kahgahgee, the raven,
Come to haunt me and molest me,
Only come yourself to watch me,
Till I wake, and start, and quicken,
Till I leap into the sunshine.' "

As Mondamin had predicted, on the last day of the contest, which was the last day of Hiawatha's fasting, Mondamin was overcome and Hiawatha did as he was commanded. His fast being ended, he returned to the wigwam of old Nokomis.

"But the place was not forgotten
Where he wrestled with Mondamin;
Nor forgotten nor neglected
Was the grave where lay Mondamin,
Sleeping in the rain and sunshine,
Where his scattered plumes and garments
Faded in the rain and sunshine.
Day by day did Hiawatha
Go to wait and watch beside it;
Kept the dark mould soft above it,
Kept it clean from weeds and insects,
Drove away, with scoffs and shoutings,
Kahgahgee, the king of ravens.
Till at length a small green feather

From the earth shot slowly upward,
Then another and another,
And before the Summer ended
Stood the maize in all its beauty,
With its shining robes about it,
And its long, soft, yellow tresses;
And in rapture Hiawatha
Cried aloud, 'It is Mondamin!
Yes, the friend of man, Mondamin!'

. . . . . .

And still later, when the Autumn
Changed the long, green leaves to yellow,
And the soft and juicy kernels
Grew like wampum hard and yellow,
Then the ripened ears he gathered,
Stripped the withered husks from off them,
As he once had stripped the wrestler,
Gave the first Feast of Mondamin,
And made known unto the people
This new gift of the Great Spirit!"

This is the beautiful story of the origin of Indian corn, which has been and is to-day of so much importance to the world.

Ancient Use of other Vegetables. It was a belief of the Cherokee Indians that all the diseases came from animals, but that plants contained a cure for every disease. It is probable, therefore, that a large number of the vegetable foods found on our tables came into use first as medicinal plants.

The cabbage was originally regarded as a remedy for drunkenness and various diseases. The Greeks thought that asparagus was a good remedy for intestinal troubles, and that the beet had very fine medicinal qualities. The cucumber was supposed to have all sorts of healing qualities, while lettuce,

the favorite plant of Adonis, possessed certain narcotic virtues. Garlic aroused the valor of warriors, and it was, therefore, avoided in times of peace. Parsley excited the brain to agreeable sensations, watercress was very refreshing, and onions were good for preserving the health. Hyssop renewed and purified the blood, thyme was good to destroy the effect of a serpent's bite, penny-royal was taken to facilitate digestion, mint preserved milk from curdling, ginger was a cure for scurvy, and asafetida was in ancient times the chief seasoning for food, since it was supposed to promote digestion. All these vegetables were in use long before the Christian era. In fact, it is impossible to go back to a time when they were not known. Patroclus probably peeled onions, Achilles washed cabbages, and many centuries before the Trojan wars the chief baker for Pharaoh fell into disrepute, probably, because of the poor bread he served.

CHAPTER III

Food a Factor in Civilization

Civilization improves as Food improves. Since the ancients believed that the gods had special care of the grain, it is only natural that they should strive in every way possible to make the food from this grain pleasing in the sight of the gods. It has been said that the first use made of fire was to prepare food for the religious feast. Whether this be true or not is immaterial. But this we know, from studying the manners and customs of people, that since the first meal was brought smoking hot from the flames or dying embers, man in his progress from primitive life has learned from experience that his disposition is affected to a certain extent by the quantity and quality of the food that passes into his stomach. Moreover, as man progresses he improves his food in order that he may the more easily utilize its health-giving properties. He not only improves what he has, but he is constantly seeking throughout the world the most wholesome food, in order that the mind and body may profit by it.

"Tell me what thou eatest and I will tell thee who thou art" is an old saying. This is just another way of stating that the food we eat is a sign of civilization. A coarse savage spirit inhabits a coarse,

rough, animal body, whether the body be that of man or beast. However, by the proper care of

Photograph by E. J. Hall

Adobe oven in an Indian pueblo. An important improvement in the art of cooking. The use of the oven among these Indians indicates a higher civilization than that of most of their North American neighbors

the body and the proper selection and preparation of food, it is possible to improve the disposition of people. The improvement in the art of cooking, therefore, has been of the greatest benefit to mankind. It has taken the raw flesh of animals slain

in the forest and so changed it that a wholesome food is the result. It has taken the leaves from the growing plant and the grain from the sheaves and has converted them into a life-giving force sufficient to withstand the increasing mental and physical strain. Nature makes us hungry, but art creates and modifies and directs the appetite and enables civilization to move forward.

Ancient Knowledge of Cooking. It has ever required the greatest skill to convert the corn of a country into a wholesome food. How to make a wholesome bread out of the cereals found in the community engaged the attention of primitive man long before the beginning of recorded history. Bread is very ancient in its origin, and the art of bread baking is older than history itself. Man learned from experience that bread supports life better than any other single food except milk, and much thought was devoted to its preparation even in the very earliest times.

Sarah, the venerable wife of Abraham, knew well how to mix flour and water into a shapely pone, which she baked in the hot ashes before her tent. The most ancient Egyptians knew how to make a light, wholesome bread, known as leavened bread, an art that the Hebrews carried with them into Palestine. The Greeks learned to mix flour, wine, pepper, oil, and milk, and the ladies of Greece delighted their friends with puff cakes whose exquisite and perfumed flour was kneaded with the precious honey of Mount Hymettus. The Roman

patrician ate a bread made by mixing flour, salt, oil, and milk, and when the white man first came to America the Indian taught him to make an ash

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The women of Jericho to-day bake unleavened bread just as Sarah did in the days of Abraham

cake from Indian corn. Not only has the world been studying bread making since the earliest recorded time, but the more advanced nations noticed real differences in the value of foods. Many centuries before the Christian era Moses taught his people the difference between clean and unclean food. The Greeks, clever students of life and of how to live, studied the influence of food on the mind and body, and taught all subsequent generations how to live.

Importance of Good Food. An individual's worth to the world is measured by his ability to think and to work. A sound mind in a sound body, therefore, is essential to one's well-being, and whoever damages the health of the body, either his own or that of another, has committed a sin against humanity and retarded the world's progress. It makes little difference whether the sin is committed in ignorance or is a conscious violation of the laws of God—the results are the same, and the world suffers.

The living body draws its nourishment from three sources,—the air we breathe, the water we drink, and the food we eat,—and each of these essentials to life may be so polluted by man as to damage the health of the body and weaken the mind. It was once supposed that these forces were presided over by special deities and that when sickness came it was because the gods were angry with their people. There is an element of truth in this old notion; but in those ancient days man gave *all* the credit or blame to the gods. We know

that man himself is for the most part responsible for the diseases that come to him. The world is controlled by law, and there are laws that govern the physical well-being of man. When he breaks these laws man suffers.

In providing food, man at times takes little thought for the actual needs and welfare of the body and throws into his stomach food so poorly prepared that the digestive organs cannot use it properly. As a result health is impaired, the body damaged, the disposition made vicious, the thinking weakened, and the whole character affected. Hence the proper selection and preparation of food is one of the most important subjects for both men and women to study to-day. When Moses gave his health laws to the Hebrews he made them equal in importance to the ten commandments. And it is just as necessary for a person to know how to provide proper food as it is for him to know that it is wrong to steal. If through carelessness or ignorance he take away the health of another, by giving or selling improper food, he has caused more damage than if he had stolen his neighbor's goods. Therefore our schools to-day are making the subject of food selection and preparation one of the important subjects for children to study. The ancient nations had severe laws against tampering with food, and to-day one of the most serious offenses against our law should be to put on the market an impure or adulterated food, or to misrepresent the quality of any article of food.

The Bread of the World. It has been well said that the quality of the bread used by the inhabitants of any country is a fair measure of their civilization, and of all cooking processes now in use by civilized man the cooking of bread is perhaps the most important. The kind of bread, however, in a given

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Panamanian children pounding rice in a rude wooden mortar

country has always depended upon the kind of corn or grain or food-giving plants found in that country.

Wheat bread is probably the most widely used bread in the world's history. It is doubtless the oldest bread in the world, since it is believed that the original home of wheat was in the Mesopotamian valley, where it is thought the human race had its beginning. Rye bread is next in importance to-day, and though it has not had such a long, continuous use as wheat it is used in Germany, France, Spain, and Greece. Buckwheat, or black wheat, is the staple bread flour of Russia, Siberia, and Brittany. Soya bread is eaten in some places, especially by the inhabitants of China and Japan. It is made from an oily pea that is native to these countries. Millet flour, made from the millet seed, produces a wholesome bread that is eaten by the inhabitants of India, China, Egypt, Italy, Spain, and Portugal.

Rice, however, is the staple food of the majority of the inhabitants of the world, although less eaten in America than in Asia, Africa, and even in Europe. Barley bread was an ancient food of note, but it is not used to-day to any great extent, except in portions of Russia. Oats was originally the grain food of Europe; it has been eaten in Germany for at least a thousand years, but to-day is eaten more in Scotland than in any other country. Arrowroot starch or flour is derived from a tropical plant grown in both the East and the West Indies, and when made into a bread

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In China rice is the staple food of the people. The grain is easily grown and has been cultivated from very ancient times

is eaten by the people of those countries. Tapioca flour makes a wholesome bread that is eaten by the inhabitants of Central America and South America. The flour is made from the roots of the plant, and is becoming very popular in Europe and America. Sago bread is derived from the pith found in the stem of different varieties of the palm in Sumatra, Java, and Borneo, and is wholesome for the people of those and adjoining islands. Iceland moss, too, is used as a food. The Eskimos purify the moss by washing it, and then make of it a fine flour that

is easily made into a bread. Indian corn, or maize, was the chief bread food of the North American Indians. It was unknown to the Old World when Columbus discovered America, but so important has it become that to-day it is cultivated on every continent and in almost every civilized country on the globe.

Rise of the Baker. The preparation of the food for the dignitaries of the world has always been an important matter. You will recall that while Joseph was serving in the house of Pharaoh he was cast into prison. Later, the royal baker offended his lord, the king of Egypt, and was also cast into prison. Here he had a dream which Joseph interpreted. His dream is interesting: "Behold, I had three white baskets on my head; and in the uppermost basket there was all manner of baked meats for Pharaoh." But in his dream the birds picked the food, and that act foretold his doom. The Hebrews, in leaving Egypt, took with them their knowledge of bread making, but they discarded the leavened bread of Egypt and made specific regulations concerning the preparation of bread "in the ovens and in the frying pans."

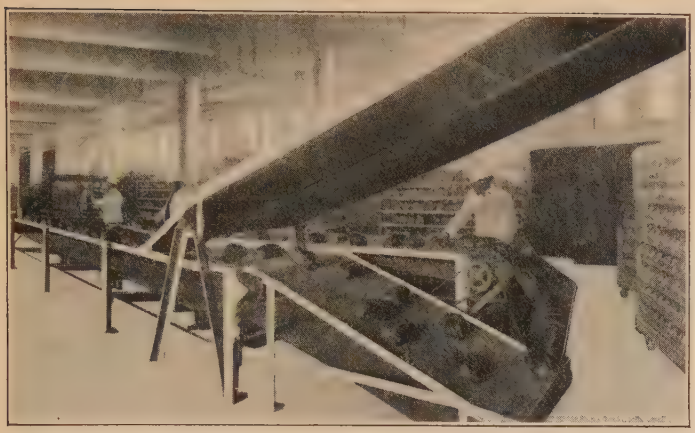
The baker, however, became an important person when people stopped their tribal wanderings and settled down to fixed ways of living. Greece had the most skillful bakers in the world. From that country they went to Rome, and the Greek baker, like the Greek school teacher, became of importance. It is a significant fact that the person who could

Courtesy of Schulze Bakery Co.

In the preparation of clean food in a modern American bakery, thousands of loaves are made daily, untouched by the baker's hands

prepare food after the most approved manner for those who followed intellectual pursuits was given honor almost equal to that of the person who taught or trained the intellect of youth. The bakers of Rome formed an association, and sometimes one of them was raised to the dignity of senator.

Bread was supposed to contain many properties, according to the mixture and preparation. Hence the baker's art was valuable as well as important. Different kinds of bread were prepared for different people. The slave was given a special kind, that would keep him humble and submissive; the athlete another kind, that would make him strong and supple; princes and senators another kind, and the fashionable ladies still another. Each was supposed to give to the individual eating it a certain force.



Courtesy of Schulze Bakery Co.

Here the bread is shown descending from the oven room above to the cooling tables, ready for the automatic wrapping machine

In the fourteenth century the baker went through a four years' apprenticeship, after which he became a master baker and received a license to pursue his occupation.

How Nations have fought for Corn. Man cannot live without food, and the great wars of the world have, in the main, been wars of conquest for new territory, new river valleys or fertile plains where the cereals grow and where the increasing population may receive food in plenty. It is an interesting fact that civilization had its birth in the great river valleys of the world, and that the great nations of the world have been those that controlled the rich, food-producing lands.

We have only a few records of a great civilization that once lived in the Euphrates Valley, where

Babylon and Nineveh contended with one another, and where, it is said, the wheat of the world had its

The fertile valley of the Jordan, one of the coveted food-producing areas of the ancient world. Here were given the first lessons in food selection and preparation

origin. From this very ancient beginning, nations have followed one another in rapid succession, each contesting for the great valleys, only to be in turn captured and destroyed by a more vigorous people. Jacob's sons, driven by hunger, went down into the valley of the Nile, begging for food. Their descendants, when more than a million strong, being held captive by the more powerful Egyptians, at last broke away from their captors. They then recaptured the valley of the Jordan, the land of Canaan, and there was given the first lesson in careful food

selection and preparation. The book of Leviticus records that the Children of Israel were taught the difference between clean and unclean food.

The Greeks, their own country overcrowded, colonized the fertile districts along the shores of the Mediterranean. The Romans went to war with the Carthaginians for the great grain fields of Sicily, and finally annexed the Nile Valley to their great empire. The congested tribes along and beyond the Danube River pressed down into the fertile valleys of Italy, France, and Spain and overthrew the Roman Empire. The wandering tribes from the cold northland and from across the Rhine overran France, England, Scotland, and Ireland, and founded nations where the land would produce a food supply adequate for the support of the people.

Commerce a Necessity. Man's support must come from the cultivation of the soil. We saw in the first chapter how the early tribes stopped their wandering life, settled down, built homes, tamed the wild animals, and began to study the land. When man went to work the products derived from the land gave food and the necessities of life, and nations began to develop. Certain people acquired skill in producing certain particular articles that other people needed. Certain river valleys became celebrated for the quantity of food produced, and other sections of the country became famous for the many articles manufactured. To bring about an exchange of products, therefore, became desirable

and necessary, and thus we have the beginning of commerce.

When Columbus was a little boy the trade between Europe and Asia, and between different countries of Europe, had become considerable, and from that time wars have frequently been resorted to in order to increase trade and to remove all restrictions upon it. In your history you may read of the great commerce carried on between Europe and Asia, and of how dependent were the European nations upon this trade with India. You may see also how Venice and Genoa became great cities because of this trade. But when this intercourse was stopped by the Mohammedans it became necessary to find a new route to India. It was this condition that caused Columbus to sail westward.

A New Food. When Columbus landed in the New World he thought he had reached India. Therefore he called the inhabitants "Indians." He found the natives eating a food made from a peculiar grain unlike any produced in the Old World, and to distinguish it from the corn of Europe we have learned to call it "Indian corn." In 1498 Columbus observed large fields of this grain growing on the island of Haiti, and in writing to Ferdinand and Isabella of Spain he spoke of passing through eighteen miles of cornfields. A few years later another Spaniard, Hernando Cortés, in describing his march to the City of Mexico spoke of passing through great fields of corn, and nearly every explorer of this new world noticed this peculiar

plant with its queer-shaped ears of corn. It is little wonder that they took special notice of it, since all the grain cultivated in Europe was similar to wheat, oats, or rye. The corn of the Indians was a curiosity.

Early English explorers, in writing about it, described it as follows: "The graine is about the bignesse of our ordinary English pease, and not much different in form and shape, but of divers colours; some white, some red, and some blue. All of these yielde a very white sweet flavoure, and being used according to its kind, it maketh a very good bread."

From Mace's "Stories of Heroism"

An Indian community corn bin, Mexico

The inhabitants of Haiti called the grain *mahiz*, hence the name "maize," and European nations when referring to it to-day still call it maize. Many authorities believe that the grain originated in Mexico and took its name from a tribe of Indians living in southern Mexico. But when Columbus discovered America it was the leading food of the Indians from the arctic circle to the torrid zone. The grain, however, was so unlike the cereals of the Old World that the Europeans did not think of using it as a food. They watched the Indians parch it or pound it into meal,

but the bread made from it was not so pleasing to the taste as the European bread, and the early explorers ate it only when starvation threatened. Over a hundred years passed after Columbus's great discovery before the settlers from Europe learned its real value.

This corn of the Indians, however, was the one grain that was to make America prosperous and end the great famines of the world. It was this grain that saved the first colonies along the coast, and supported the pioneers as they pressed westward; and the grain that fed the Indians was to provide food for the early settlers as they drove the Indians from the river valleys along the coast to the lands beyond the Mississippi. When the coastal plain was settled and all its river valleys taken up, the population still pressed westward, fighting the Indians and the wild beasts, until the fertile valleys of the Mississippi and its tributaries were reached. It took nearly two centuries and a half, after the first settlement at Jamestown, for the white man to take possession of this great river valley and send its products to the markets of the world. Not since the Nile Valley fed so many nations has so large a part of the inhabitants of the world been fed from one great river valley. It was maize, this Indian corn, that gave strength to the settlers in their conquest of the New World; and after this great valley was opened it was maize, this same Indian corn, at first despised by the Europeans, that made the Mississippi Valley the food center of America and the granary of the world.

How did the people provide against famine before Indian corn was discovered? The story as told in the following chapter explains how difficult it was for the nations of Europe to provide sufficient food before this great cereal was given to the civilized world. And if this one grain that Columbus found on the island of Haiti were suddenly taken from the world, famine and pestilence would again stalk abroad in the land and the progress of the world would come suddenly to a standstill.

CHAPTER IV

How the Discovery of a New Continent Affected the World's Food Supply

Evils due to Insufficient Food. Of all the plagues and scourges that have visited the peoples of the world, none have been so fearful and so fatal as the great famines, and nothing so places man at the mercy of disease as insufficient food. In India when the grain supply has been insufficient, disease has always been rampant; and since hardly a year passes that some sections of that country are not visited by a famine, India has come to be looked upon as the home of the great plagues of the world. China, too, with its poorly cultivated land, its dense population, its inferior means of transportation, constantly faces the menace of famine and the resultant spread of disease. When the potato crop failed in Ireland, disease crept in during the period of scarcity. Much of the illness of the soldiers in the great wars of the world, and of the inhabitants who have suffered the ravages of devastating armies, has been due to insufficient food. In the Middle Ages the pestilence and the plagues were always worse when food was scarce.

It is said that twenty-five per cent of the people in the larger cities of the world are barely able to secure food, clothing, and shelter sufficient to

protect them from actual want. Wherever man is unable to provide the bare necessities of life for

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Canton, China, where 400,000 people live in river boats. This densely peopled land, badly cultivated, with poor transportation facilities, is in constant danger of famine

himself and family we have a breeding ground for disease that threatens the whole population, and a people ready to entertain any pernicious religious or political doctrine that may tend to overturn the existing order of things. Therefore any shortage of, or any sudden rise in the cost of, food products, due either to political or to economic conditions, has a tendency to upset the social institutions of the world.

The Cause of Famines. Two thousand years ago all the races of Europe, except those living along

the coast of the Mediterranean, were composed of ignorant and warlike tribes. When they settled in different sections of Europe, built homes, cleared the land, and began raising their own foodstuffs, they were dependent for their food supply upon their own farms or the neighboring forest. The products of other countries did not come to them as they do to us to-day. There were no steamboats or large vessels to carry food from one continent to another; there were no railroads with long trains of cars to carry the necessities of life from one section of the country to another. In fact, there were few roads over which even horses or oxen could pull heavy loads of merchandise. If a town was located on the coast or on a navigable river it had some advantage, for light sailing vessels could reach it. But settlements away from the coast or back from the streams were dependent upon their own products.

Foodstuffs were too bulky and heavy for the commerce of the time. Therefore the traders who passed from one country to another dealt chiefly in the luxuries of the rich or in commodities which had a high value. You will recall that the long line of camels carrying goods from India and China to the European peoples, before Columbus discovered America, transported only the lighter goods, such as spices, perfumery, and fine cloth. The great laboring classes were not benefited to any great extent by this trade.

Moreover, each nation as a rule produced only one grain, on which the people relied for food. It

is difficult to-day for us to understand the full meaning of this fact, since we have two leading

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A caravan crossing the desert. Two thousand years ago such camel trains afforded the chief means of transportation

cereals, wheat and Indian corn, and if one fails the other is produced in sufficient quantities to provide against famine. But before America was discovered, when the leading crop of a country failed the people were without bread; animals, too, suffered, and so the meat supply also became exhausted. The means of transportation being so poor, bread could not be carried easily from one nation to another, and famine appeared in the land.

The Famines of the World before America was settled. The following table gives the dates of the great famines before the lands of a new continent

were cultivated and before a new cereal was given to the world:

B.C. 1708–1701	Egypt and adjoining civilizations.
B.C. 436	Rome and the country bordering the Mediterranean Sea.
A.D. 42	Egypt especially; but since Egypt was the granary of the world it affected much of the civilized world.
A.D. 262–72	Rome and England were especially affected.
A.D. 879	A universal famine in Europe, Asia, and Africa. Men, women, and children were sold into slavery for the price of a day's meal.
A.D. 1016	Throughout Europe. For the five years following not a country in Europe could be named that was not destitute of bread.
A.D. 1162	Universal famine in Europe, Africa, and Asia. Human flesh was eaten, and sometimes sold in the markets of Europe.
A.D. 1314–15	All northern Europe and England. This was the "great famine" of England; wages received a permanent rise owing to the scarcity of labor.
A.D. 1586–1600	Within this period famines swept over the British Isles, India, Russia, and other parts of northern Europe.

In addition to these widespread famines, hardly a year passed that some nation was not visited by a shortage of food. A poor crop due to excessive or insufficient rainfall, or to the ravages of insects, would throw the entire community into a destitute condition. And the absence of adequate transportation facilities made it impossible for the inhabitants to import food in sufficient quantities to provide against starvation.

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The story of a seven years' famine in Egypt in prehistoric times is told on these stones found on an island in the Upper Nile River, above Assuan

The Famines of the World since America was settled. In studying the table of famines since America was settled, it is important that we notice

especially what countries have been most affected and the small areas visited in the more enlightened nations. Notice how the more civilized nations have finally ceased to be afflicted with this disaster, and observe at the same time the few countries that are visited to-day.

1631	India and Asia in general.
1711	Austria-Hungary.
1769–71	India. (10,000,000 starved in Bengal.)
1775	Cape Verde Islands.
1781–83	India. (8,000,000 perished.)
1789	Parts of France. (This was during the French Revolution.)
1790–91	India, the "skull famine." (So many people perished they could not be buried.)
1795–97	Parts of England. (This was during the great European wars.)
1846	Ireland. (Due to the failure of the potato and wheat crops. Caused the repeal of the "corn laws" in England.)
1870	Persia.
1873–75	Asia Minor and India.
1877, 79, 88, 89	China.
1891–92	Russia.
1899–1901	India. (1,000,000 perished.)
1911–12	Russia.

We observe that few famines have visited the enlightened nations since America was settled, and even these were of a local nature, and attributable, in large measure, to the fierce wars of the times. A great famine, such as appeared in Europe at the close of the sixteenth century, has not returned to scourge the civilized world since America was opened up and a new source of food

supply given to the world. On the other hand, observe how destructive have been the famines in

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Primitive cultivation of the soil, China. This plow turns a furrow only six inches wide

India, China, and certain parts of Russia. These countries, with their overcrowded population, poor transportation facilities, primitive methods of cultivating the soil, and lack of intercourse with rapidly developing nations of the world, have remained almost as backward as were the nations of Europe a thousand years ago; so the evils that came to Europe so many centuries ago still afflict the inhabitants of these unprogressive countries.

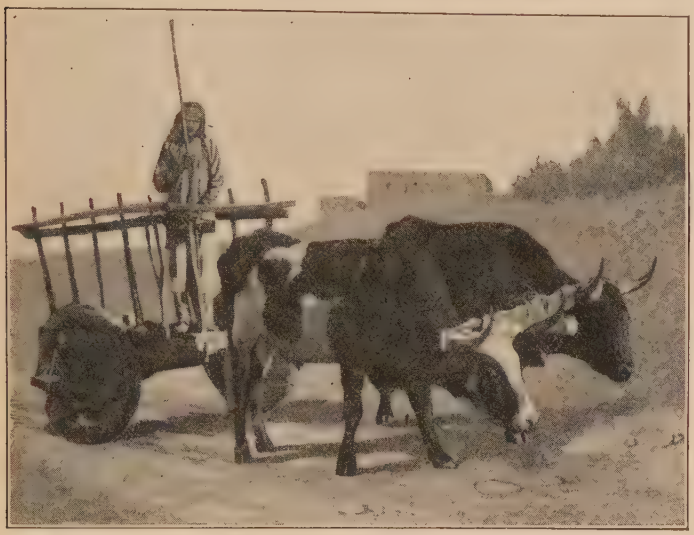
Relation of Commerce to the Food Supply. The discovery of America at the close of the fifteenth century was an incentive to commercial activity. The world wished to know more of this new continent, and the spirit of adventure was abroad among

the nations. Larger vessels were built; daring seamen were no longer afraid to lose sight of land; and idle men in the large cities of Europe caught the spirit of adventure and embarked for the New World. Commerce was now shifted from the Mediterranean Sea to the Atlantic Ocean. Stronger vessels were needed to sail the seas, and the art of shipbuilding became more highly developed. As larger vessels were built, heavier cargoes were transported in them, and vessels were soon carrying needed foods to Europe. Within a short time after Columbus discovered America, tropical fruits found in the West Indies and South America were sold in the streets of London, and a new era in transportation had begun. Vessels were now beginning to carry food from one country to another; nations came closer and closer together, and men became more familiar with the habits of their fellow beings in different parts of the earth.

As commerce increased, famines sweeping over large areas grew less and less frequent, for the surplus food supply of one people could now be transported to the famished districts of other parts of the globe. People living away from the coast or the navigable rivers saw the necessity of building better roads. Stronger vehicles, such as wagons and carriages of various kinds, were built, and the commerce of the world began to reach the interior settlements and to draw them closer to the world-markets.

From the discovery of America to the present

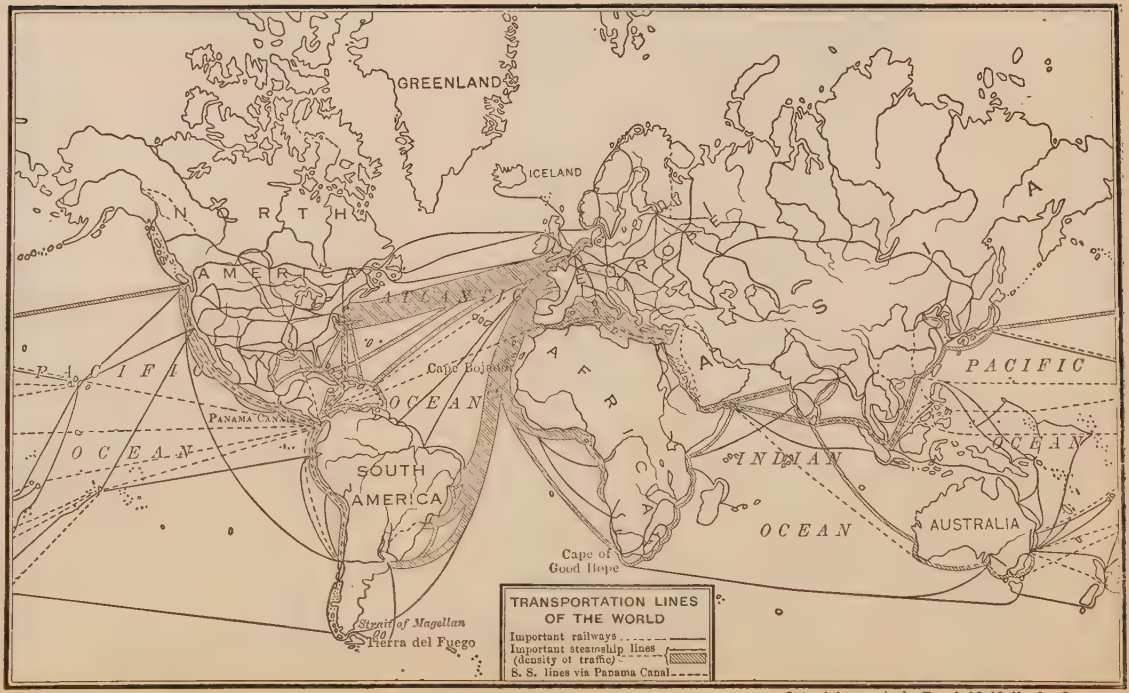
time, trade in the necessities of life has increased more and more. To-day a very large part of the



A Mexican oxcart. With the coming of the crude but strong oxcart the commerce of the world began to reach interior settlements

commerce of the world consists of articles in general use, such as wheat, corn, rice, bacon, hams, butter, cheese, cotton, wool, iron wares, and leather. By comparing the commerce of to-day with that of ancient times we can see how the world is becoming more united, and the great extent to which each section of the globe is dependent upon other sections for articles in daily use.

Why Universal Famines have not occurred since 1600. It will be remembered that America was discovered in 1492 and that throughout the



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Map showing the transportation lines of the world in 1916

century from 1500 to 1600 the principal nations of Europe were exploring this new continent and dividing it among themselves. New foods were discovered and carried to Europe. The potato became an important food, especially in England and Ireland. So important did it become in Ireland that it is now known as the "Irish potato." Moreover, the great famines of the latter part of the sixteenth century, and the accompanying plagues, had considerably reduced the population in those countries where the famine was most severe. With the opening of the new century Europe began to send her surplus population to America; and then another food, of far greater importance than the potato, was given to the white race,—the corn or maize of the Indians. These two new foods, together with the great fisheries along the coasts of America, increased the food supply of the world.

The science of agriculture, moreover, now began to play an important part. Indian corn became the leading cereal of America. It was so easily cultivated, and it could be produced in such quantities, that the earliest colonists relied on it almost entirely for food. With it they could produce hogs and cattle in abundance. Therefore bread and meat became cheaper than ever before. It is no wonder that by the poor of Europe this new world was looked upon as the Promised Land.

The New Continent. Columbus sought a route to India, where spices, precious stones, fine fabrics, and all the luxuries of the rich were found, but

instead of reaching India he discovered a new world. Two great continents, heretofore unknown to the wisest men of Europe, lay across the ocean route to India. Here gold and silver were first found in abundance, and for many years the adventurous Europeans thought only of these precious metals. But in the northern continent, now known as North America, there were river valleys more fertile than the ancient valleys where great civilizations had flourished. When hardy explorers such as Cortés, De Soto, Drake, Gosnold, and Cartier were studying this new world, little did they realize its vast possibilities. They could not, of course, see that Indian corn and its products would one day become more valuable than any other agricultural product to the commerce of America. They could not even estimate the importance of the great Mississippi Valley to the hungry people of Europe. Little did they dream that they had found a land more than twice the size of Europe, and possessing fertile valleys that would become the homes of millions of Europeans and their descendants, and supply wholesome food for many more millions.

America gave millions of square miles of rich farming lands which were to produce tremendous quantities of foodstuff. This in turn created many new demands. Larger and swifter-moving vessels were needed to transport thousands of people from the Old to the New World and to carry back to the Old World the abundant yield of the rich valleys of the West.

CHAPTER V

A New Continent and a New Food

Interest in the New World. Nearly a hundred years passed after Columbus discovered America before any European nation succeeded in locating a colony in what is known to-day as the United States. The explanation of this delay is to be found in the geography of the world at that time and in the limited and slow methods of transportation. In those days, when it required three months and sometimes longer to cross the Atlantic, this new world was far removed from the civilization of Europe.

When the news was told in Europe that a new continent had been discovered, and that it contained all manner of game and large quantities of gold and silver, you can imagine the sensation that was created. Notwithstanding the difficulty in crossing the Atlantic, every nation became intensely interested at once. Exploring parties were sent out, some to hunt for gold and silver, others to bring back furs, and still others, merely to explore the new country and to study its peculiar inhabitants. Europe soon lost interest in India. The old caravan routes declined in importance, and the nations of Europe became active in building and fitting out vessels that could make the trip across the Atlantic.

The Wealth of the New World. It would be interesting to follow the exploring parties from the European ports into this remarkable new world. Exciting expeditions and thrilling adventures fill the period of the first hundred years after its discovery. The Spaniard enriching himself with the abundance of gold found in the palace of the Aztecs in Mexico, and the natives of South America living in mountains rich in silver, excited the imagination of the explorers to such a degree that they were ready to believe any tale, however wild or fanciful. And many were the tales that were told—tales of fountains of crystal water, pure and life-giving, that would restore youth and make it perpetual; of rivers that flowed from ocean to ocean; of the fabled cities of Cibola filled with gold and silver. These and many other stories excited the adventurous spirit of all the Europeans. Vessel after vessel set out for the New World, and during these hundred years explorers crossed and recrossed the continent and tramped up and down the coast, along the valleys, and over the mountains, talking with the Indians and studying signs and stories, in their search for wealth or for the fabled Fountain of Youth. Spain profited most, for there was really an abundance of gold and silver very easily obtained in Mexico and South America. Therefore Spanish adventurers confined their explorations to this section of the New World.

As these adventurers and wealth seekers told their wonderful stories to an astonished world, they

thought little of the peculiar grain that the Indians gave them to eat when they were hungry. Little

An Aztec calendar carved on stone. This calendar doubtless governed the time of planting and harvesting of maize

did they dream at that time that the little green blades of maize, as they pushed up through the rough and poorly cultivated soil, had the power to draw from the darkness of the earth beneath more

wealth than could be dug from all the mines, and that it had more health-giving properties than all the fabled cities or Fountains of Youth. For the time, they thought little of this new food and would eat it only when they were in a famished condition.

How America was divided among the Europeans. The spirit of adventure was abroad. It was natural, therefore, that the ownership of this new continent should become in time an important question. When this question came to be decided the claim of each nation was made to rest largely upon the priority of discovery. Spain discovered and explored what is now the West Indies, Florida, Louisiana, Texas, and Mexico. Therefore this territory was claimed by the Spaniards, and it was here that the Spaniards settled. English seamen, under the Cabots and others, discovered and explored the strip along the Atlantic coast from Florida to the St. Lawrence. Hence the English claimed this part of the New World, and it was here that the English settled. The French discovered and explored the valley of the St. Lawrence, the region of the Great Lakes, and a portion of the valley of the Mississippi, and it was this territory that the French claimed. Thus the first hundred years were spent in exploring or obtaining wealth from the New World. The map given on the next page shows the sections of the continent claimed by the leading nations of Europe.

The First English Settlement. At the beginning of the seventeenth century, England presented many difficulties to her laboring population. Europe at

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North America in 1650

that time was just recovering from a great famine that had affected almost every country. Moreover, Europe was soon to be convulsed by a continental war destined to last for nearly half a century, and war falls heaviest on the laboring man who receives scanty wages and enjoys few luxuries. There was a great demand for wool in England to supply the factories, and farming land was giving way to pasture land. As a result, vast areas of tilled land were taken out of the hands of the tenant farmers and converted into sheep pastures; peasant farmers lost their holdings, while farm laborers were thrown out of employment and in many instances knew not where to look for work. Political conditions in France had driven out of that country many of the leading weavers and spinners. In every European country, labor conditions were disturbed. Throughout the seventeenth century the political conditions affecting labor, the many wars that were sweeping over the countries, the changes in manner of living, and religious intolerance, all contributed to the settlement and growth of the American continent.

The success of the Spaniards had set every country wild over the prospects of great wealth to be found in this new land. But the English were free to settle only that portion of the new continent along the Atlantic coast between the St. Lawrence River and Florida, where no gold was to be found. Because of this, several commercial companies, seeing the unsettled labor conditions in Europe, conceived the idea of settling colonies of people along the fertile

valleys of the coast and deriving a considerable revenue from the trade growing out of their products of the soil, forest, and mountains. With this intention the companies obtained large grants of land from the king, equipped some small sailing vessels, filled them with families, and in 1607 started them on the first voyage to a country three thousand miles from home. One unsuccessful

From Mace's "Stories of Heroism"

The ruins of Jamestown as they appeared in 1857. Here in 1607 was made the first permanent English settlement in America

attempt to plant a colony on Roanoke Island had been made a quarter of a century before. This time the expedition entered the mouth of Chesapeake Bay and landed on a little peninsula, now an island, a short distance up the bay. On this island was founded the Jamestown colony.

Early Difficulties. This settlement consisted at first of about a hundred people. Of this number the majority were classed as gentlemen; only twelve

men in the whole company were laborers who knew anything at all about tilling the soil or were accustomed to hard work. It is easy to see, therefore, that such a company, locating in a country infested with bears, wolves, and hostile Indians, would meet with many difficulties. The soil was new to them; the climate was different from that to which they were accustomed; they were located in an unhealthy region and were without houses in which to live. No wonder they did not settle down to orderly work, but spent their time looking for gold, rather than planting crops. Many died of fever, and before the summer was over only about half of those who had come over survived, and even these did not have enough food to last until harvest should come again. However, another vessel came soon, bringing other colonists, together with supplies, and the number was increased to about two hundred. The settlers were necessarily slow in adjusting themselves to their new surroundings, and they soon began to complain against their fate.

No wonder the little colony in Virginia felt a loneliness and a longing for the home folks in Europe as the gloomy Atlantic moaned and rolled along the coast, and the deep, sighing forest seemingly stretched almost to Eternity. Like the ancient Hebrews who, in the face of the hardships of the wilderness, rebelled against their leader and requested him to take them back into slavery rather than forward into an unknown future, so the first settlers in America complained against their lot, and did

little at first to improve their new and strange surroundings. They killed the cattle and the sheep, exhausted the food supply, and then begged for permission to go back to England.

How a New Food was given to the World. It was the courage of a great leader that saved them. Captain John Smith faced the situation and forced all to work. Said he, "Every man that gathereth not as much as I do every day, the next day shall be set beyond the river and forever banished from the fort." All around the settlers was food in abundance, but it was so unlike the European food that they were slow to adopt it. They saw the grain from which this food was made growing around the Indian wigwams. They were told that this precious grain, when parched and crushed into a fine powder, would sustain life longer than any other similar amount of food; that the Indians in preparing for a long journey filled their belts with it and lived on it almost exclusively. They were told, furthermore, that a small pinch of it, taken at frequent intervals during the day, would give the traveler strength and endurance either to make long journeys or to undergo great hardships.

John Smith had gone among the Indians and learned from them how to use this new grain, and when the supplies sent over from England were exhausted, Smith and his men fell back as a last resort on this Indian food. Every man was immediately given an acre of ground and instructed to "set corn" in it. In the meantime the settlers

traded with the Indians, and thereby kept themselves supplied with food until their crops could be harvested. In this way they were saved from starvation. The early history of America contains many descriptions of the cultivation of corn, and many Indian stories of its wonderful value. The feast of the new corn, which occurred during the harvest moon, was the great thanksgiving holiday of the Indians, and for several days the savages gave themselves up to unrestrained revelry, and great rejoicings for the kindness of the Great Spirit in sending the grain. The white men at Jamestown learned to appreciate the great value of this new food. It was so easily cultivated that the colonists soon had food in plenty, and from those early days to the present time the people of Jamestown and their descendants have never been close to a great famine.

How the Pilgrim Colony was saved. You will recall that the next English settlement was made at Plymouth. This little party of settlers landed December 21, 1620. Although it was winter, the men began immediately to chop down trees to build a great log storehouse. Then they began building homes. The first winter in the cold northland was the saddest the Pilgrims had ever known. Before the warm spring days came one half of the little band had perished, among them their governor. In that dreadful winter the Pilgrims bought "eight hogsheads of corn and beans" from their Indian neighbors, and when spring arrived a friendly Indian

named Squanto taught them how to plant the new grain. He showed them how to fertilize it by

Plymouth Harbor, where the Pilgrims landed December, 1620

putting dead fish into the hills, how to hoe the plant, and how to pound the ears into meal. The new plant grew in the cold northland as well as in the river valleys of the warm southland, and when the first summer was over and the Pilgrims had gathered their first harvest, there was food in plenty. The colonists, therefore, decided that a time for rejoicing and thanksgiving had come to them, too. So, inviting the friendly Indians who had done so much for them, for three days they rejoiced and gave thanks. This was the beginning of our custom of having a day of thanksgiving each year. Thus it came to pass that a new continent gave fertile land and homes to the people of an overcrowded nation, and a new food of great value to those who before they came to America had faced starvation in Europe.

How the First Settlers depended upon Corn. The first settlers were no doubt surprised to find that this new grain, so easily cultivated along the coast, would yield so abundantly. The colonists at Jamestown first tried to cultivate wheat, but for many years met with little success. In fact, a new variety had to be developed suitable to the soil and climate of the New World, and it required a number of years to produce such a variety. In the meantime the settlers had to study the new grain that the Indians used for food. Of course the bread made from it was not so pleasing at first as that made from the grain of the old country, but it was wholesome and really not unpleasant. Moreover, the settlers found it very easy to raise this new grain. One man, with little or no assistance, could produce enough to support himself and his family and still have a surplus. Having his bread thus easily provided, he could go into the forest and with his rifle secure animal food in abundance, at the same time obtaining skins for clothing. Hides, tobacco, and the surplus corn were bringing great prosperity to the colonists. The chief source of their wealth, however, was this new grain that they had found growing around the wigwams. So important was it that it soon became one of the leading articles of trade. Taxes, marriage licenses, rents, and other debts were paid in it, since little money was in circulation among the early colonists.

The one important fact to remember in connection with the first settlements is that the wealth of the

New World was locked up in the soil. Spain thought it was in the gold and silver, and France thought it was in the fisheries and furs; but the English, after facing starvation, turned to the soil for support, and they discovered after many hardships that the soil of the New World was rich enough to support the hungry hordes of Europe. The first settlers, therefore, became farmers, and their success and continued prosperity brought over thousands from Europe until settlements were made along the coast from Maine to Georgia.

Two Stories. A writer gives this account of the importance of corn to the early colonists: "It is common to see men demand and have grants of land who have no substance to fix themselves further than cash for the fees of taking up land; a gun, some powder and shot, a few tools and a plough; they maintain themselves the first year, like Indians, with their guns and nets; and afterwards by the same means with the assistance of the lands; the labour of their farms they perform themselves, even to being their own carpenters and smiths; by this means, people who may be said to have no fortunes are enabled to live, and in a few years to maintain themselves and families comfortably. . . . They fix upon the spot where they intend to build their homes, and before they begin it, get ready a field for an orchard, planting it immediately with apples chiefly, and some pears, cherries, and peaches. This they secure by an inclosure. Then they plant a piece for a garden;

and as soon as these works are done, they begin the house. . . . As soon as this work is over, which may be a month or six weeks, the settler falls to work on a field of corn, doing all the labor of it, and, from not being able to buy horses, pays a neighbor for the ploughing of it. . . . It is surprising with how small sum of money they will venture upon the cruise of settling; and it proves at the first mention how population must increase in a country where there are such means of a poor man's supporting his family; and, in which, the larger the family, the easier the undertaking."

The second story is told by Thomas Ash, a clerk on board his Majesty's ship *Richmond*, who was sent to Carolina in 1682. Speaking of the colonists he said: "Their Gardens begin to be supplied with such European Plants and Herbs as are necessary for the Kitchen, viz.: Potatoes, Lettice, Coleworts [cabbage], Parsnip, Turnip, Carrot and Reddish: Their Gardens also begin to be beautiful and adorned with such Herbs and Flowers which to the Smell or Eye are pleasing and agreeable, viz.: The Rose, Tulip, Carnation and Lilly, etc. Their Provision which grows in the Field is chiefly Indian Corn, which produces a vast Increase, yearly, yielding Two plentiful Harvests, of which they make wholesome Bread, and good Bisket, which gives a strong, sound, and nourishing Diet; with Milk I have eaten it dress'd various ways: Of the juice of the Corn, when green, the Spaniards with Chocolet, aromatiz'd with Spices, make a rare Drink, of an excellent

Delicacy. I have seen the English amongst the Caribbes roast the green Ear on the Coals, and eat it with a great deal of Pleasure: The Indians in Carolina parch the ripe Corn, then pound it to a Powder, putting it in a Leathern Bag: When they use it, they take a little quantity of the Powder in the Palms of their Hands, Mixing it with Water, and sup it off: with this they will travel several days. In short, it's a Grain of General Use to Man and Beast, many thousands of both kinds in the West Indies having from it the greater part of their Subsistence. The American Physicians observe that it breeds good Blood, removes and opens Oppellations. At Carolina they have lately invented a way of makeing with it good sound Beer; but it's strong and heady: By Maceration, when duly fermented, a strong Spirit like Brandy may be drawn off from it, by the help of an Alembick."

Indian corn

Importance of Corn in the History of America. It is quite probable that no other product of the soil has been of such tremendous value to any people as this new cereal was to the first settlers of America. It saved them during the first starving times and made them exceedingly prosperous. It was so easily produced and the yield so abundant that our first colonists were soon in better condition than their friends and relatives in Europe. It was the basis of the wealth of the country; and since it flourished in every section, every planter had plenty and a surplus. Men paid their debts with it and exchanged it for the luxuries of Europe. Cattle and hogs were easily fed in the forests and meadows for a large part of the year, but the abundant corn supply greatly aided the planter in fattening them for the market. In this way corn indirectly contributed again to the wealth of the colonists, since the hides, beef, and pork formed a considerable part of their commerce and found a ready market in Europe.

This new food soon became known in Europe, and from that time famines have been growing less and less frequent, and corn—together with its indirect products such as beef, hides, and pork—has been forming a larger and larger part of the commerce of the world. Therefore the commerce of the coast, the opening up of this vast continent, and the great wealth of the whole country have depended in large measure upon this new grain that the Indians gave to the first settlers.

Our Gold. "Drop a grain of California gold into the ground, and there it will lie unchanged until the end of time, the clods on which it falls not more dead and lifeless. Drop a grain of our gold, of our blessed gold, into the ground and lo! a mystery. In a few days it softens, it swells, it shoots upwards; it is a living thing. It is yellow itself, but it sends up a delicate spire, which comes peeping, emerald green, through the soil; it expands to a vigorous stalk; revels in the air and sunshine; arrays itself more glorious than Solomon in its verdant skeins of vegetable floss, displays its dancing tassels, surcharged with fertilizing dust, and at last ripens into two or three magnificent batons, each of which is studded with a hundred grains of gold, every one possessing the same wonderful properties as the parent grain."[1]

[1] Edward Everett.

CHAPTER VI

The Lure of the Land

Land Ownership. There is nothing so essential to life and the welfare of a people as fertile lands. From the beginning of history until the present time the great wars of the world have been for the most part contests for rich lands; hence the most important event in history since the beginning of the Christian era was the discovery of America.

If we examine into the causes of the decline of the great nations of the past we find in almost every instance that the majority of the people ceased to have a share, or an opportunity to share, in the land of the country. All the land became divided into large estates owned by a wealthy and privileged class, and those who tilled the soil became slaves, or peasants whose lot was as hard as that of slaves. When such a condition prevails the land declines in productivity, the food supply is affected, and the nation's strength is greatly impaired.

When the first settlements were made in America the bulk of the land of England and of other European nations had passed from the hands of the people into great estates, owned and controlled by a comparative few. In England all the land was owned not only by a very small proportion of the people but in such a way that it was usually handed

down from father to son and as a rule did not pass out of the family. It was practically impossible

Sheep grazing in England. Often when wool was dear the fields were turned into sheep pastures. Then the tenants, deprived of employment, turned eagerly to the free land of America

for the great laboring class of people, who really tilled the soil, ever to own the land they worked. Tenants subject to removal by their landlords cannot be said to be entirely free, for the landlord could turn his fields into sheep pastures or make any changes he desired, and throw the tenant out of employment. Since their occupations were not always certain, and since it was frequently the case that the food supply of this overcrowded country was too small for the needs of the people, this class of tenant farmers was dependent in many instances upon the charity of the landlords for the actual

necessities of life. Even the English government, at last roused to pity by such destitute conditions, enacted what was known as the "poor laws," making it compulsory upon the parishes to distribute free food to families in times of great distress. Under such conditions the laboring man could not attain to real independence and self-respect.

The Free Lands of America. When the free lands of America were finally opened to the world, and after the hardships of the first settlers had given place to great prosperity due in large measure to the corn of the Indians, it was only natural that this tenant class of farmers should look to the New World. They were eager for land because it would produce corn, and each man who had been a tenant in Europe and subject to the charity as well as the will of the landlord might now himself become a landlord in America. He might be independent. His land would produce both wheat and corn, while in England the climatic conditions were such that only wheat could be produced. Therefore he had a much greater opportunity for making a living and creating wealth, and he now learned for the first time what freedom really was. He had slaved in Europe, stinted his family, and taken his political and religious faith from his master, the landlord. But in this great open New World where food was plentiful, and clothing and shelter easily obtained, he took orders from no one and felt himself the equal of any other man on the whole round world.

Free public lands that would produce great

quantities of foodstuff were the greatest single influence in America's development. The most servile of men in the Old World when once in the New World could feel the force of this universal sense of freedom, because he could own his home and have food in abundance. It was natural, therefore, that these people should rejoice in their freedom and with feeling discuss their rights whenever the English government began to interfere with them. The early history of each colony tells how those pioneers would meet under the shade of the trees and there hold their courts or assemblies and discuss their rights as free Englishmen. It was frequently the case that groups of settlers dressed in buckskins and hunting shirts, armed with hunting knives and flintlock rifles, and feeling no restraint whatever, walked into the presence of the doughty old governor of a colony and threatened him with violence, or even defied the whole English government. Think of a mere handful of men defying the great English nation! This was characteristic of men who for the first time in their lives were enjoying real freedom to the fullest extent.

How America was Settled. These free fertile lands called the landless peasants of Europe to our country in great numbers. The desire to reach America was so great that many poor laborers bound themselves to the owners of vessels and were sold into servitude for a term of years for an amount sufficient to pay their passage. After working out their time, these servants secured land

on the frontier, built homes, cleared small patches, planted corn, and became prosperous men. Vast

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For more than three hundred years immigrants have been coming to America from every nation of the globe, seeking freedom, new homes, and new opportunities

hordes of laboring men, leaving the old home ties, set out for the New World, where a man was free to make a living as he pleased, free to worship as he pleased, and free to entertain any political idea he pleased. There was no other such country in all the world. England and Germany, and later Russia and Italy, sent their landless peasants here, while all the nations of Europe drove their persecuted men and women hither in search of new homes and

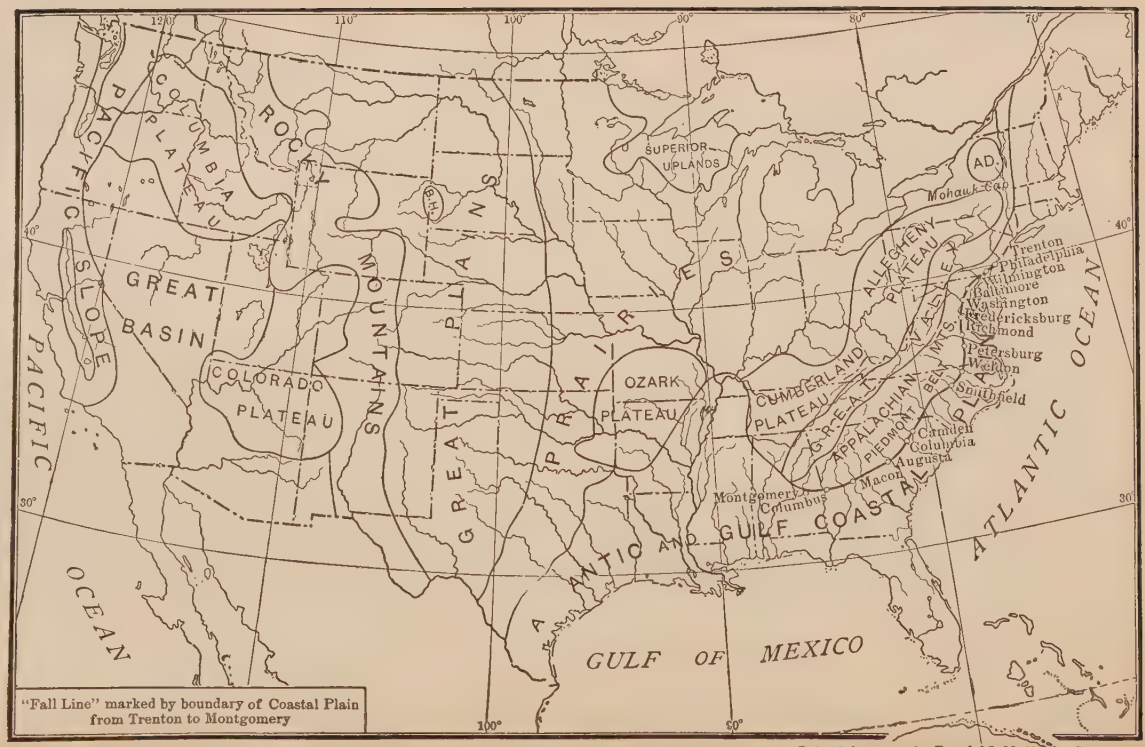
new opportunities. It is well to observe also that comparatively few settlers came from Switzerland and Holland. These countries have added little to our population, because they are countries in which the land is held by small proprietors, who own their homes and love their country. But the nations that chiefly settled America are nations of large estates, whose landless peasants endured untold hardships in a new country to secure land on which to build homes. Having once established their homes on land of their own, their allegiance was easily transferred to the New World. Most men care little for the form of government so long as they are free to make a living for their families and are able to protect their homes.

Religious and Political Persecution. However, it was not alone the free lands that contributed to the growth of the American colonies, although that was the greatest single factor in their development. You have already learned of the unsettled political conditions in Europe. In the seventeenth century the governments of Europe frequently took sides in the religious discussions and persecuted those who did not belong to the same denomination as did the ruler of the nation. Men and women were burned at the stake for daring to believe differently. Moreover, though many did not think the king was always right, if people dared to criticize the rulers or to advocate political principles different from those held by their sovereigns, they, too, were often persecuted and sometimes thrown into jail or burned at the stake.

The religious persecutions in England from 1620 to 1640 drove more than twenty thousand men and women to New England, and during the succeeding twenty years as many more were driven to Virginia, Maryland, and the Carolinas. So great was the exodus that by 1700 there were at least two hundred sixty thousand Europeans in America seeking new lands, greater prosperity, and freedom from Old World tyranny. By 1750 there were more than a million inhabitants in the New World, among them many from England, Germany, Sweden, France, and Italy. Settling first in the river valleys along the coast, they built their homes, cleared the forests, and planted corn, which was to be their chief support and the basis of their wealth.

The Thirteen Colonies prospered on Corn. We have already told how and where the first English colonies were founded: the one at Jamestown, Virginia, the other at Plymouth, Massachusetts. Suppose you take your history and learn how each of the thirteen early colonies was formed. The one at Massachusetts Bay grew to be Massachusetts, and from it were formed Connecticut, Rhode Island, and New Hampshire. Along the coast we find New York, Pennsylvania, New Jersey, Delaware, Maryland, Virginia, North Carolina, South Carolina, and Georgia. Each one had its beginning in the lands bordering the sea, along the rivers, or near the bays and sounds. Corn was produced in each of these colonies, more or less abundantly, and it was easy for one to make a living.

If we draw a line parallel to the coast, beginning at Trenton, New Jersey, crossing the Potomac at Washington, the Roanoke at Weldon, the Neuse at Smithfield, and passing through Camden and Columbia, South Carolina, and Augusta, Georgia, we shall cross the rivers at their falls and outline the boundary of the coastal plain. In this section, between the Fall Line and the coast, the first settlements were made. Here were to be found the rich river valleys that would produce food in abundance. After having enough for their own needs the people could put the surplus corn into boats and send it to the West Indies or to South America, and trade it for some of the products of those countries. But between the Fall Line and the mountains was a vast area far removed from the commerce of the East. This was the great back country. It was easy for those living on the sounds, bays, and navigable portions of the rivers along the coast to exchange their surplus products, accumulate wealth, and enjoy many of the luxuries of Europe. In fact, every great and prosperous people up to this time had been thus favorably located. In Europe the back country suffered most, since the roads were so poor that the vehicles of the times could not transport heavy merchandise for any great distance, and it was not every back settlement in Europe that could produce enough food for its own use. In America, however, it was different. It is true that we had no roads, and commerce between the settlers of the hilly country and the towns along the rivers was next to



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A physical map of the United States

impossible. But in America there was one grain that would grow abundantly anywhere. Therefore, if men were fleeing from Europe to escape religious or political persecution or were tired of economic slavery and were seeking free lands, whether they settled almost up to the arctic circle or within the torrid zone, there was one food that gave them support and made them independent—the corn of the Indians.

As the colonists of America pushed up streams into this back country they planted this new grain and it brought forth as abundantly in the piedmont sections as in the river valleys of the East. Even there it was easy to live, and the free lands, where plenty abounded with little labor, drew thousands and hundreds of thousands past the settlements of the East. Beyond the falls of the rivers they passed, turning first one way and then another, wherever the land was unoccupied. They cut down trees, built homes, and made clearings. A small patch of ground planted in corn would support the wife and children, and the head of the family was free to hunt the wild animals in the forests.

Life in the wild country was free, open, and without restraint. There were no roads save the trails of the Indian or buffalo. Below the fall line the settlers built their homes to face the rivers or the sounds and bays. These were their roads, and sometimes they were spoken of as "running roads." But, whenever possible, settlers in the back country built their homes on or near the old Indian trails,

Photograph by E. J. Hall

An Indian trail. Many pioneers in the hill country settled on or near old Indian trails. Later these trails widened into roads, some of which have determined railroad routes

along which many passed in their search for new lands. At first these trails were but rough paths marked out through the forest, but along them the pioneers built many houses, and soon little villages sprang up. When the wagon came into use as the best means of carrying the produce of the interior to market and bringing in return the necessities of life, the trails were widened into rough roads. But those early settlers in the back country had little need for roads. Corn gave them their bread and

food for their horses; the rifle gave them meat and much of their clothing; and they made their own furniture and some of their clothing material. Only once or twice a year did they go down to the towns along the rivers to buy salt and the few other things they needed.

How the Piedmont Country depended on Corn. Indian corn was the most valuable crop of the back country, too, since it furnished an easily obtainable food for the settlers. Many hogs, after being fattened on it, were driven in great numbers to markets many miles from the interior. It was not an unusual sight to see two or three men, or a man and his boys, driving, always toward the East,

A flock of sheep in the piedmont country. Here the rich pasture lands have been utilized for stock raising since the days of the earliest settlers

great droves of hogs, fattened on the nuts, acorns, and Indian corn of the hills. Their progress was slow and the journey to market often required many days and sometimes many weeks. Cattle, too, were fattened and driven to market in a similar way, and even to-day, in the districts farthest removed from the railroads, it is a common thing to see a driver on horseback, with two or three assistants, driving great herds of cattle to market. It was frequently the case that a flock of turkeys or geese, two or three hundred of them, could also be seen passing along the trail on the way to market.

In those early days, when there were no restrictions placed on the making of whisky, many farmers used their corn for that purpose. Hogs could be fattened on the mash; and it was not unusual for a farmer to carry the whisky in his wagon and drive his hogs ahead of him as he journeyed to the town. This was one of the ways in which the corn of the interior reached a market in the days when the Indian trail was first widened into a road.

Tobacco, too, which had a ready money value in the markets of Europe, was packed in large hogsheads and rolled sometimes many miles to market. In order to gain time the farmer would fasten two shafts to the hogshead and, hitching his horse to it, would drive the load to market, the hogshead rolling along on its journey. This was a favorite mode of conveyance until long after the railroad came.

The Growth of the Colonies depended on Corn. It would be difficult to find another instance in the

history of the world comparable to the growth of the English colonies in America. Within a century and a half a new civilization was established, possessing a sense of freedom and prosperity such as the world had never before witnessed. The desire for homes in the new country was so great that at times there were barely enough vessels to convey the great numbers of people who sought the freedom of the New World, where a new food made living easy and free lands nourished a free spirit in the race. But settlements soon reached the mountains, and still people demanded more free land. Not gold, mind you, but land that would produce corn!

As the land-owners in America began to prosper they desired laborers to work in the fields. They knew that in England there were carpenters, blacksmiths, and field laborers who were falling into poverty and even crime for lack of means to earn an honest living. Therefore they began to import white servants. Agents on the streets of London advertised the great advantages to be secured in this new world. Thousands of poverty-stricken people made contracts with these agents to serve on the plantations for a term of years if the planters would only pay their passage to America. The term of service varied with the age of the servant: if over twenty-one years of age, he was to serve four years; if under twelve, seven years. For persons between twelve and twenty the usual term of service was five years.

In addition to these white servants a few negroes

were brought over to work in the fields, and this was the beginning of negro slaves in English America.

The Call of the Frontiers. We have seen how the nations of Europe settled the land along the coast. In time these settlements became flourishing colonies with stable governments. At the time of the Revolutionary War there were thirteen of these colonies, each governed in a sense by authorities in England. But there was always the back country, the frontiers, that was free and open to all. And it was the frontiers that kept America free, since any man discontented with the government of the colonies along the coast could move into this country, there to enjoy life with absolutely no restrictions. It was the frontier life that supplied a perpetual stream of freedom that flowed back continually into the older colonies which were growing more conservative and more like old England every day.

The English landlord, who understood thoroughly the helpless condition of the peasant tenant class of England, could not understand why a peasant servant class did not develop in America. The reason is to be found in the free lands. A white man of energy would not long remain a tenant, for there was an abundance of land that he might own for the asking where no landlord had jurisdiction. Therefore, the frontiers were always being settled by a class of people who were building homes probably for the first time, and who above all others enjoyed the benefits of personal liberty. In England there was no land to be had at any price; the

wealthy landlords held it all. There was no place for the peasant tenant class to go, nothing for them to do, but submit to the will of the landlord, or emigrate to America. In America the landlord of the large estate in the South could not reduce his tenants to servitude because they could leave him and acquire free lands at any time. This is why the free lands on the frontiers have contributed so much to the freedom of America.

It is quite probable, however, that if the colonists could not have crossed the mountains they would, within a few decades, have become as conservative and as aristocratic as England, since there would have been little to stimulate and feed the instinct for freedom with which every individual is born. Moreover, this free spirit, ever springing up on the frontiers which no government could reach and no officer molest, has been furnishing red blood for our American life for three hundred years, and filling our nation with the democratic ideas of personal liberty and equality of opportunity.

An endless stream of settlers kept continually moving westward into the wild, free lands of the frontiers, and still the great primeval forests stretched farther in that direction—how far, none knew. But the dense and gloomy woodland in which roamed all manner of wild beasts and savage Indians was ever attractive to the hardy pioneer. It was always calling him on, always appealing to his adventurous spirit, and always arousing his desire for conquest and his sense of freedom. It

Photograph by E. J. Hall

Through the mountainous regions of Tennessee an endless stream of settlers moved toward the wild, free lands of the frontier

was the same spirit that drove the wandering tribes across Europe more than a thousand years before. France, England, Spain, and Italy afforded similar attractions when the Northmen, Huns, Vandals, Goths, and others came out of the north and west and took possession of those countries. So in America the western wilds were always beckoning to the white man, and he was constantly pushing thitherward into the unknown.

The Land beyond the Mountains. By studying the map on page 61 you will see that the English colonies were hemmed in on the north by the French, on the south by the Spaniards. On the west lay the Appalachian Mountains. Immigrants were coming in such numbers that expansion was absolutely

necessary, but the settlements could not expand far toward the north, for there were the French; neither could they expand far toward the south, for there were the Spaniards. They had to move westward across the mountains. But there were many difficulties to overcome since the mountains, in those days of poor roads, were almost impassable to large bodies of settlers. Then, too, beyond them roamed many tribes of savage Indians. Therefore, many years passed before the Englishman crossed the Appalachians and looked into that great territory drained by the Mississippi and its tributaries.

It was in the present state of Virginia that settlers first reached the mountains. Virginia was becoming much like England, the land as a rule being divided into very large plantations which were handed down from father to son as was the case in England. A similar land tenure prevailed in most of the Southern States. It was different, however, in New England. Therefore, it was in the South, and especially in Virginia, that the settlers pushed farthest west. First went the trapper and hunter, seeking game and furs, and his stories of the wild country that always stretched farther and farther westward attracted the cattle and hog rangers, who moved in and built their cabins, cleared the land, and began to raise corn. There was something especially fascinating about this wild frontier life, where a man could live easily without much labor and do just as he pleased. No taxes, no officers of the law, nothing to molest him save the wild

animals that attracted him thither and the Indians who might steal upon him.

In their movements westward the settlers usually followed old Indian trails; these were the first roads. There was a natural pass leading from the headwaters of the Potomac River across the mountains into the Ohio Valley. The Indians had made this pass their great highway from the East to the West. Along this trail the first settlers passed in attempting to reach the new lands beyond the mountains. But when that little band of Virginians had crossed the mountains and built their little cabin homes in the valley of the Ohio, behold! there were the French claiming the whole valley. The French had come into this region by way of the St. Lawrence, the Great Lakes, and the northern tributaries of the Ohio, and they at once drove this little band of Virginians back across the mountains.

At last the English colonists had heard the word, Halt! In crossing the mountains they had come face to face with the French. What would be the result? Would the mountains be the western boundary line of the English? How much land lay west of them? Would it produce corn? In their attempts to answer these questions the English colonies along the coast not only broke through the mountain passes but entered into a great war with the French for possession of the greatest corn country in the world.

CHAPTER VII

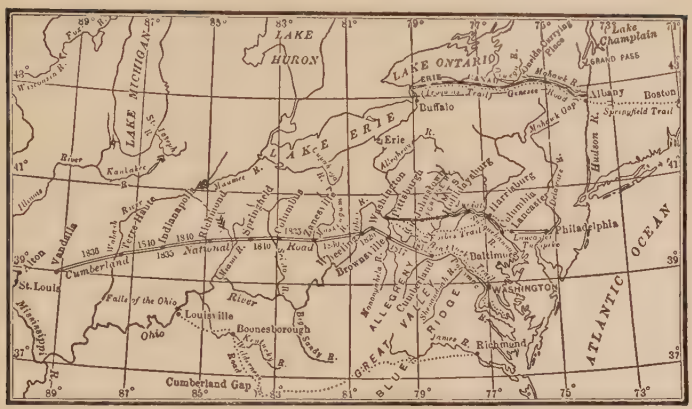
Opening the Great Corn Country

Why the English Settlers were slow to cross the Mountains. There were two waterways opening into this great valley beyond the mountains—one by way of the Mississippi River from the south, and the other by way of the St. Lawrence River and the Great Lakes from the north. As we have read in a previous chapter, the Spaniards first explored the land around the Gulf of Mexico and along the lower Mississippi; but they found no gold, and they laid no claim to the country. The French entered this region through the second doorway, that is, from the north, by way of the St. Lawrence River and the Great Lakes. Passing from the lakes to the Mississippi, they went down the river in their canoes and took possession of the entire Mississippi Valley. The English had settled along the Atlantic coast, but they claimed all the land to the west of their colonies as far as the Pacific Ocean. However, the Appalachian Mountains, running parallel to the coast, at the most only a few hundred miles inland, formed a barrier which the English found difficult to pass. At first, only a very few settlers from Virginia endured the dangers and hardships and crossed over into that wild and exceedingly dangerous country beyond the mountains.

Ancient Highways. Long before the white man settled the river valleys of the East, or even before this new continent was discovered, the buffalo and the Indian had discovered passes through the mountains. Droves of buffaloes first marked out the paths in passing from the Mississippi Valley to the Coastal Plain, and the Indians followed them in hunting or war expeditions. When the English made their homes along the coast these trails were clearly marked, and as they were easily followed they became our first roads

The first trail of importance led across the state of New York by way of the Hudson and the Mohawk rivers. This was perhaps the most important Indian trail on the American continent because it made a short and easy connection between the Great Lakes and the Atlantic Ocean. The Mohawk Valley, that connects the Great Lakes region with the Hudson River, was owned and controlled by the Iroquois Indians, however, and all travelers crossing from the Hudson River to the Great Lakes along this route had to pass through the heart of the territory of the most powerful Indians on the continent. Hence this trail was not followed to any great extent by the English until after the Revolutionary War.

Another trail ran from the Delaware River, at the present location of Philadelphia, through western Pennsylvania, to what is now Pittsburgh. A very important trail followed the Potomac River to what is now Cumberland, Maryland, and thence across the



Early highways to the West. These trails, first used by the Indians, later were traveled by pioneer settlers

mountains to the Ohio River to what is now Wheeling, West Virginia. It was along this trail that the first Virginia colonists traveled. The fourth great trail led from northeast North Carolina, along the ridge near the boundary of the state, across southwest Virginia, through Cumberland Gap into Tennessee or northward into the blue-grass region of Kentucky. Hunters and trappers, if they were cautious, could follow these trails very well, but it was extremely difficult to move families along them, since provisions enough to support them had to be carried and at the same time they had to be protected from the Indians. We can see, therefore, some of the difficulties the English had in taking the Ohio Valley, especially as the French were already in actual possession of it.

The Disputed Territory. Examine the map above and trace the Potomac River to its source, and

thence cross to Wheeling, West Virginia. See how near together are the sources of the Potomac and the Ohio rivers. Turn to the map on page 82 and observe what a vast territory is drained by the Mississippi and its tributaries—one of the greatest river valleys in the world. If the French could have succeeded in keeping the English out of the Ohio Valley, the Appalachian Mountains would have formed the western boundary of the English colonies. You can easily see, then, how very important to Virginia was the Ohio Valley, embracing as it did the present states of Kentucky, Ohio, Indiana, and Illinois.

The Virginians did not understand the great fertility of this land west of the mountains. They only knew that it was a great river valley, that settlers desired more free land, and that the Indians living in this valley were already raising much corn with very little labor. This was perhaps the most prosperous section inhabited by the Indians; the fertile river valley and rich prairie lands produced so much corn that famine was seldom known even under the most primitive method of cultivating the soil. Here the Indians were very powerful, and here they fought longest against the English settlers who were now claiming the right to settle this fertile prairie country.

The French were already in possession of the country, and in those days rights and claims amounted to little unless the nation interested was on the ground and in actual possession. France had established herself very securely by building forts

in this great valley before the Virginians knew of it. Then Virginia acted promptly, and sent young George Washington across the mountains to warn the French against settling in the Ohio Valley. If you wish to get a good description of the difficulties of travel across the mountains, and what settlers had to endure in attempting to reach the Ohio River, read the story of Washington's journey to the Ohio and his return. It was in the year 1753 that he made that famous journey. At that time, nearly one hundred fifty years after the first settlement was made at Jamestown, English settlers had made very few attempts to find homes beyond the mountains.

The English take possession of the Land beyond the Mountains. It was a far cry back to the starving times when John Smith made every man take his hoe and go to work, and when the Indians first taught the settlers the value of Indian corn. Over a million inhabitants were now living in the thirteen colonies along the coast, and the settlements had at last reached the mountains. Hunters and trappers had already visited the wild region and brought back wonderful stories of the country and of the amount of game to be found there. More farms were needed, and English settlers were demanding the free lands beyond the mountains.

The French made it plain to George Washington and to Virginia that they considered this great valley their own, and that they were ready to fight for it. Over this disputed claim Virginia went to war with the French. Soon England took part in

the struggle. The result was a great European war in which the mother countries engaged in stubborn combat. The French, in taking possession of the Ohio Valley, had made friends with the Indians. They were interested chiefly in fur trading, and in this the Indians could be of great assistance to them. When the French and English colonists went to war the Indians of the region were the natural allies of the French. Hence the war in America was called the French and Indian War. Our United States histories treat it at length and the details are known to every school boy. In this struggle France was defeated and England took possession not only of the Ohio Valley, but of all the territory east of the Mississippi except the strip of land on which New Orleans is located. This strip and everything west of the Mississippi France ceded to Spain.

After the English were victorious the Indians who inhabited the valley were most hostile to all English settlers. For this reason the settlers were unable to follow the northern trails into the Ohio Valley. The only natural highway into this new country left for them, then, was the southern trail, by way of Cumberland Gap.

Daniel Boone leads the Way. The United States owes much to Daniel Boone, who led the way into this great country beyond the mountains; for he opened up the greatest corn country in all the world. During his service in the French and Indian War, he had heard of the wonderful beauty and fertility of the western country, especially the portion

of it south of the Ohio River. At the close of the war, having returned to his North Carolina home,

Photograph by E. J. Hall

Ferry at High Bridge over the Kentucky River. Into this beautiful and fertile country Daniel Boone blazed a way for hundreds of emigrants

he took a few friends and started in search of that promised land "blessed with the richest of soils and the balmiest of climates, with noble forests and luxuriant expanses, where thousands of buffaloes and other big game browsed."[1] The Indians called this beautiful land "Kentucky," and preserved it as a hunting ground nominally open to all tribes.

In 1760 Boone, at the head of a hunting party, followed an old Indian trail across western North

[1] H. Addington Bruce in *Daniel Boone and the Wilderness Road.*

Carolina. But it was not until three years later that he had his first view of the blue-grass region of Kentucky. While looking from a Cumberland Mountain peak at a herd of buffaloes grazing below, he is reported to have said:

"I am richer than the man in the scriptures, who owned the cattles on a thousand hills. I own the wild beasts of more than a thousand valleys."

It was really a hunter's paradise; and Boone was a great hunter. On account of the hostility of the Indians he did not enter the blue-grass region on this trip, but determined to visit Kentucky at some future time. Two years later he made another attempt to explore this region, but after touching the eastern edge of it, and taking many furs in the winter's hunt, he found the journey so difficult that he returned home.

Boone was constantly sounding the praise of this new country. It fascinated him. He made several other visits, each time returning laden with valuable furs. On the last of these hunting trips he selected a site for a home and returned to get his family and others who might desire to accompany him. On September 25, 1773, with his wife and children and a number of other families, he started for the blue-grass country. As the large caravan passed through Cumberland Gap on the old Indian trail it was joined by many other emigrants from the valley of Virginia. Leading their pack horses and driving their cattle before them, they journeyed westward to a new home.

But the party was not destined to enter the blue-grass region without many hardships. The Indians, ever remembering the French and Indian War, were planning a general uprising to drive out the English. In their first encounter with Boone's party several of Boone's men were killed, among them Boone's eldest son. Throughout the entire Ohio Valley the Indians carried on the bloody war, and it was not until 1775 that Boone reached the spot he had selected for his new home. In the meantime other settlers had preceded him into the new country. A settlement had been made by James Harrod, in 1774, several months before Boone's party arrived. In the same year, 1774, the Ohio Indians made a treaty with Virginia, surrendering all their land south of the Ohio River. In the following year the Cherokees ceded all of their territory south of the Ohio as well as that between the Kentucky and Cumberland rivers, known as Transylvania. Less than a month after the treaty was made Boone founded Boonesboro, which became the headquarters of the colony.

By the indescribable energy, courage, and heroism of Daniel Boone the way was finally opened for hundreds of emigrants from the seaboard to enter the great prairie country. The old Indian trail through Cumberland Gap was widened into a road known as "The Wilderness Road," which became the main highway between the seaboard and the land beyond the mountains. This Kentucky country now became a part of the territory of Virginia.

Fertility of the Western Country. In 1779, when the pioneers and settlers were pouring through the passes of the mountains into the great plain now known as Kentucky, Virginia offered each householder four hundred acres of land at the rate of two dollars and a half a hundred acres, on condition that a house should be built and corn planted within a year. A writer describing this new country said:

"A log house is very soon erected. Sometimes

Photograph by Wm. Baylis

A typical home of the early settlers in the corn country

they are built of round logs entirely, covered with rived ash shingles, and the interstices stopped with clay or lime and sand to keep out the weather. The next object is to open the land for cultivation. There is very little underwood in any part of this country, so that by cutting up the cane and grubbing up the trees you are sure of a corn crop. . . . The ground will yield from fifty to sixty bushels of corn to the acre. The second crop will be more ample;

and as the shade is removed by cutting the timber away, a great part of our land will produce from seventy to one hundred bushels of corn from one acre. This extraordinary fertility enables the farmer who has but a small capital to increase his wealth in a most rapid manner."

A hundred bushels of corn to the acre is indeed a bountiful yield, and with thousands of buffaloes flourishing on grass and wild clover, turkeys so numerous that they appeared to be one flock scattered in the forests, and the woods abounding in wild game, it is easy to see that this country would attract many settlers from the East. And they came. The old Wilderness Road was at times crowded with families seeking new homes in the land of abundance. They came chiefly from the southern colonies. Virginia, North Carolina, South Carolina, and Georgia sent many thousands annually. The Indians were still hostile north of the Ohio, and many settlers from Pennsylvania and Maryland crossed Virginia, took the old Indian trail to Cumberland Gap, and either entered Tennessee or followed the Wilderness Road into the blue-grass country.

Troubles with England. However, before this western country was securely settled, the thirteen colonies along the coast were having serious trouble with the mother country. Such prosperity as we have described in this new world, where land was practically free, food plentiful, and living easy, would naturally develop a spirit of freedom,—an

independence of thought not easily controlled by England three thousand miles away. Histories tell the causes and results of the Revolutionary War. If you will study these causes you will find that complaints of the colonists were directed against what they considered violations of their rights as free English citizens in America. Many of these men who were clamoring for rights had been tenants in the old country. Now they were no longer tenants, subject to the will of a landlord. The free spirit, nourished and cherished in this free, open country, soon rebelled; the result was the American Revolution, which gave independence to the English colonies in America. But while the thirteen colonies were fighting under George Washington for independence, a band of settlers beyond the mountains was pushing across the Ohio River into the prairie region and opening up the great corn country.

George Rogers Clark. It was chiefly through the courage of one man, George Rogers Clark, of Virginia, that the country which has since become the center of the corn production was saved to the United States. In the same year that Daniel Boone founded Boonesboro, Clark went as surveyor to the new Ohio country, and the next year (1775) he established his home in Kentucky. The thirteen colonies had declared their independence, and the old French settlements north of the Ohio incited the Indians to rebellion. The western settlements had to fight again the French and the Indians who still remembered the earlier French and Indian War.

Clark's iron will, independent spirit, audacious courage, and magnificent physique soon made him a leader among his frontier neighbors.

While thousands of settlers were now following the southern trail through Cumberland Gap and

The Ohio River at Parkersburg, W. Va. The fertile plain north of the Ohio, won through the bravery of George Rogers Clark, gave the new nation the greatest corn country in the world

along the Wilderness Road into the great corn country, as yet they had not crossed the Ohio River. The fertile prairies were still in the possession of the Indians, who were again at war with the Kentucky settlers. Arms and ammunition were especially needed to drive back the Indians. Clark, soon after his arrival, was chosen to go back to Virginia, the parent colony, and ask the legislature for these supplies. Accompanied by a trusted friend, he set out at once. After many hardships, thrilling experiences, and much delay, they received an order

for the needed supplies, and set out on the return journey, a party of seven men altogether. Crossing back over the mountains by the same trails they had followed to Virginia, they traveled down the Ohio, fighting as they went, and after many hardships delivered the ammunition to the settlers.

How the Corn Country was taken. The new colony was hundreds of miles from Virginia, and was constantly overrun with the most bloodthirsty savages. The settlers were forced to spend much of their time defending their forts, attending to the wounded, and burying the dead. They could raise few crops. Therefore they had to depend for food almost entirely on hunting. The danger was so great that it was only with the utmost care that they could do any work at all. They were fortunate in having their small patches of corn to rely upon for some food. No other grain would have yielded so abundantly under such difficulties. In fact, it was the corn patches around the forts that saved Boone's colony from perishing. In this country also the Indians raised great quantities of corn, so Boone's men frequently seized food from the Indian villages. But as the war between England and the colonies continued, the situation in Kentucky grew worse, until some thought the only way to have peace and security from the Indians was to surrender to the English and be carried as prisoners to Detroit.

At this time Clark decided to return again to Virginia and ask for troops. The governor promised troops if men could be found; but the home state

needed all the men it had, and more. However, the government did promise to give three hundred acres of land in the acquired territory to each man who helped to win it. Clark returned to Kentucky with a company of about one hundred fifty men. It was decided to cross the Ohio and attack the French town of Kaskaskia, lying on the Mississippi River in the present state of Illinois. On the evening of July 4, 1778, the soldiers reached Kaskaskia. The appearance of Clark was so unexpected that the town surrendered without resistance. Satisfied with the assurance that its people would be well treated if they submitted to the Virginian government, the little French town became an American possession. Clark then sent a small company up the river to capture the neighboring town of Cahokia. It, too, was surprised, and surrendered without resistance.

These military expeditions in southern Illinois were so successful that it was next decided to march across the present state of Illinois and capture Vincennes, an important stronghold on the Indiana side of the Wabash.

The easy capture of Vincennes completed the conquest of southern Illinois. The French inhabitants of these towns, who had been on friendly terms with the Indians, persuaded them to make peace with the white men, or "Long Knives," as Clark's soldiers were called. Clark had so impressed the Indians with his bravery and his fighting qualities that they agreed to remain at peace.

With these victories Kentucky was delivered from much of its danger, and the territory north of the Ohio was at last free to become a part of the new nation as soon as the treaties could be made with foreign countries. Twice the settlers had had to fight for possession of this great valley. They first took it from the French nation and made it English territory. English colonists under Clark fought the French settlers and the Indians and secured to the new nation the greatest river valley in the world. In taking possession of it, moreover, the pioneers of Boone and Clark discovered that this was the greatest corn country in the world, producing in some places from fifty to seventy-five or even a hundred bushels of corn to the acre, and this was done by settlers who had few implements and no improved machinery with which to cultivate the land. It is easy to see, therefore, that settlers in the East would not live as tenants, or even work poor land of their own, when by simply crossing the mountains they could take up this land at a very small cost, and by scratching the surface with a piece of crooked iron, used both as a hoe and a plow, get fifty bushels of corn to the acre. Such a wonderful yield with so little labor began at once to draw the surplus population from the East and even from Europe. Indeed, so great did the stream of immigrants become that the stability of the East at times seemed threatened.

The Geography of the Corn Country. The map of the United States shows that the Ohio River rises

in western Pennsylvania, and, flowing in a southwesterly direction, empties into the Mississippi River near the southwestern corner of Kentucky. If we now proceed up the Mississippi to the Missouri, thence up the Missouri bordering Nebraska and through the Dakotas, we have marked out the great Northwest. Ohio, on the east, is neither upland nor lowland, but is in general a plain with an average altitude of from eight hundred to nine hundred feet. This plain slopes gradually from the Alleghany Mountains on the east toward the Mississippi and the Great Lakes. A line of low hills running north of the middle of Ohio divides the water flow, some rivers emptying into Lake Erie and others into the Ohio River. Ohio is not a prairie state, since it was originally covered with forests of walnut, beech, maple, buckeye, chestnut, ash, and hickory.

Indiana is very much like Ohio, although about one eighth of it is strictly prairie. Illinois is the great prairie state. Here LaSalle found the open meadows "with rank herbage and deep black soil, with shallow valleys and sluggish rivers." When trees appear they grow along the rivers. Crossing the Mississippi, we find that Iowa is much like Illinois. Westward, the plain rises gradually to the highlands of the Rocky Mountains. But west of the central portions of Nebraska the rainfall decreases, fields of grain begin to disappear, and pasture lands are more abundant. Here the corn country ends. A change in climatic conditions produces an arid region, which begins in central

Nebraska and Kansas and extends westward to the mountains. Parts of Missouri, like Iowa, are nearly forestless. The border state of Kentucky is much like the country to the north of the Ohio.

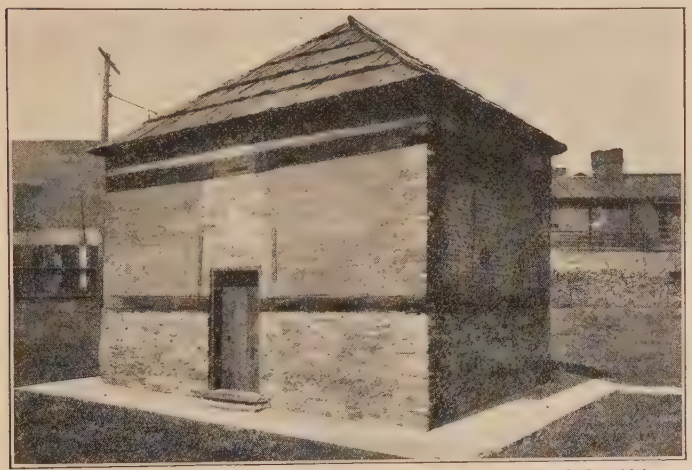
Since there were no trees to clear away, the first settlers in this prairie country had nothing to do but break the ground, plant the corn, and harvest tremendous crops. For thousands of years nature had been enriching the soil. The Indians, it is said, had long ago burned the trees away, and the white man found a veritable garden spot, a farmer's paradise. Such was the prairie country that was soon to become the great granary of the world.

CHAPTER VIII

Settling the Corn Country

Beyond the Appalachians. The Appalachian Mountains, extending from Maine to Alabama, for nearly two centuries acted as a natural barrier to the westward movement of population.

Even when Washington took command of the Revolutionary army, only a small band of home-seekers, chiefly hunters and trappers, had crossed over into that unknown region west of the Appalachian ranges. A fort stood at the head of the Ohio



Fort Pitt to-day. In 1776 this little fort at the head of the Ohio was the center of one of the three settlements in that vast valley now the center of the world's food supply

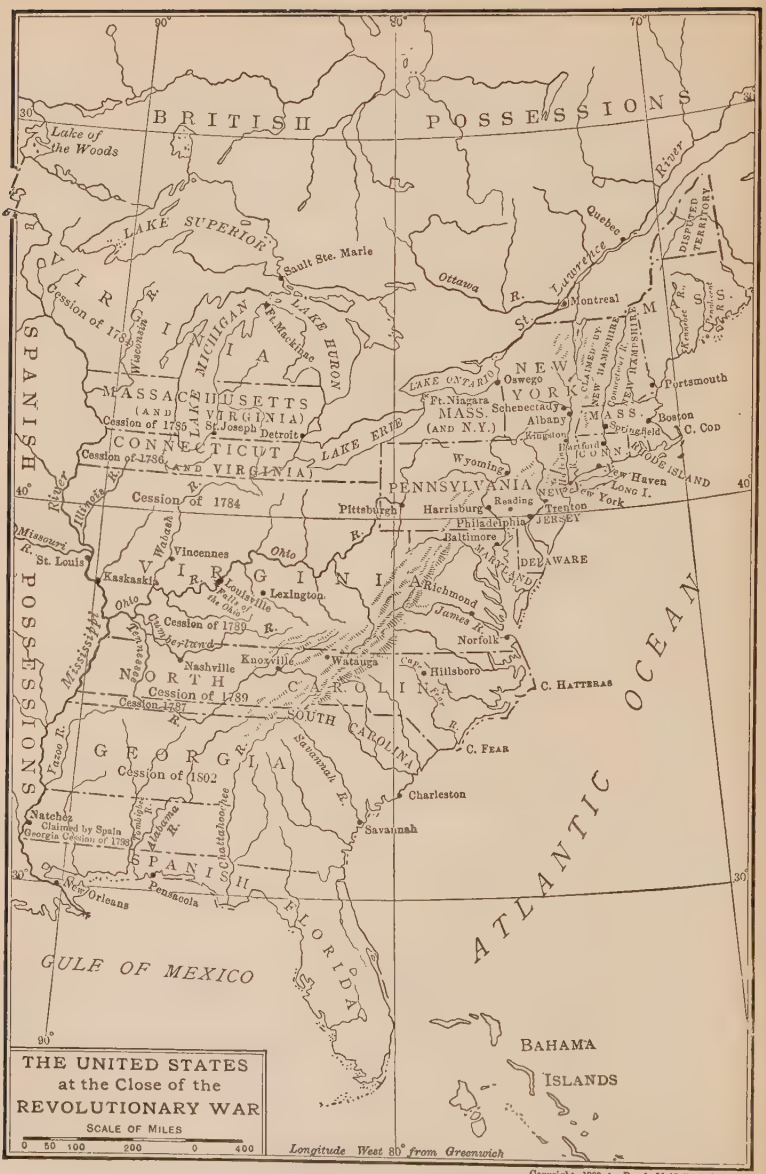
River, and around it were built some twenty or more log huts, where traders and trappers collected furs and prepared them for the markets of the East. A small settlement was to be found in Tennessee, and another in Kentucky. These were practically all the English settlers between the great Appalachian Mountains and the Mississippi River, an area larger than the whole country east of the mountains. When independence was secured and the land west of the mountains was wrested from the hands of the savages, little did the world foresee that the small patches of corn cultivated by the first settlers would spread over the whole prairie country, making the Northwest the center of the world's food supply and transferring the heart of the nation from the seacoast to the Upper Mississippi Valley.

In those days the East knew less about the West than we to-day know about the interior of China. But after the war the government needed money. Taxes were much talked of, and there was little money in the country. Land along the coast was costly, food was getting higher and higher, and people were often imprisoned for debt. In the wild country beyond the mountains, land was practically free, and the luxuriant cornfields told of a prosperity that was unknown in many sections of the East, where the land was often barren and rocky and, because the soil was thin, growing less and less productive every year. The growing hardships in the East and the increasing attractions

offered by the West were destined to disturb the whole economic life of the people under the new government. But there were many difficulties to be overcome before the rich cornfields of the West could command the homage of the East and the patronage of the world.

Political Difficulties: (1) States' Rights. The period from the close of the Revolutionary War to the adoption of the Constitution in 1789 is rightly named the "Critical Period" of our history. No strong central government existed. Each state was practically independent, and jealous of its rights. Foreign countries had little faith in the new nation. English statesmen openly prophesied that these thirteen states would soon fall to quarreling and fighting with one another, that England would be called upon again to take possession of the government, and that the last estate of this new, loosely constructed nation would be worse than the first.

It is well to remember in the first place that all the land west of the mountains was claimed by the states east of the mountains. For example, Virginia claimed Kentucky, Ohio, Indiana, Illinois, Michigan, Wisconsin, and a part of Minnesota. Massachusetts claimed western New York and a part of Ohio, Indiana, and Illinois. Connecticut and New York likewise claimed a part of the latter states. North Carolina, South Carolina, and Georgia claimed all the territory lying south of Virginia and between the Atlantic Ocean and the Mississippi River.



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Map showing the claims of the thirteen states

Even before peace had been declared with England a controversy arose between Virginia and the states to the north over the possession of the vast territory between the Ohio River and the Great Lakes.

While the states were disputing over this western territory, Congress was unable to raise taxes or to pay the soldiers for their services during the war. Washington pleaded with them to go home; but they would not disband until they had obtained some assurance that they would receive their back pay. Seeing no prospects of being paid, they became enraged over this seeming disregard of their dues, and more than a hundred of them marched into Philadelphia, where Congress was sitting. Such a boisterous and riotous demonstration was made that Congress was frightened, the members fleeing across the river into New Jersey.

(2) **Forming the Northwest Territory.** This incident showed how helpless the new nation was in times of distress. There was also much discontent otherwise throughout the several states. The little colonies west of the mountains in Tennessee and Kentucky became dissatisfied, and either revolted or threatened to revolt from the parent states. The government was unable to pay its debts or to keep its contracts with foreign countries. A tax was levied on food products, though the cost of living was already excessively high. To add to this trouble at home England was still arrogant and hostile toward the new country.

In the midst of these difficulties, General Rufus Putnam, of Massachusetts, sent to Congress the outline of a plan to colonize the region between Lake Erie and the Ohio River with veterans of the army, who were fitted to protect the border from Indian attacks. The land was to be laid out in townships six miles square, "with large reservations for the ministry and schools." Penniless Congress, by selling the land to the soldiers at a merely nominal price, might obtain an income, and at the same time recompense the old soldiers for their services in the only substantial way that now seemed practicable. Washington greatly favored this scheme. The states were willing to give up their claims to the western territory; and the old soldiers were glad to accept this land in settlement of their claims against the government. A series of treaties were made with the Indians, and a large number of settlers—old soldiers of excellent character whom the war had impoverished—were ready to go and take possession at once. Thus was laid the foundation of what is known in history as the "Northwest Territory."

(3) **Government of the Northwest.** It became necessary at once to provide some kind of government for this region. The act of Congress organizing the "Northwest Territory" into a separate government is called the Ordinance of 1787. It provided that this territory should ultimately be divided into states not exceeding five in number, any one of which might be admitted into the Union

as soon as the population should reach sixty thousand. In the meantime settlers were to be "under the immediate government of Congress." There was to be "unqualified freedom of religious worship," public schools were to be established, and slavery was to be abolished. Out of this territory were formed later the prosperous states of Ohio, Indiana, Illinois, Michigan, and Wisconsin, a combined area somewhat larger than that of Germany with The Netherlands.

General St. Clair was appointed governor of the Northwest Territory; surveys were made; land was put up and sold at sixty-six cents an acre, payable in certificates of public debt; and settlers came in rapidly. The western exodus from Pennsylvania and New England now began, and only sixteen years elapsed before Ohio, the first of the five states, was admitted into the Union.

The Difficulties in the West. The first great difficulty was in reaching the West. The four routes that led to this remarkable country, as outlined in the preceding chapter, were (1) the Hudson-Mohawk trail, (2) the Pennsylvania trail, from Philadelphia to Pittsburgh, (3) the Potomac River trail, and (4) the trail through Cumberland Gap and along the Wilderness Road. The first two were the most popular highways after the organization of the Northwest Territory. The map on page 95 shows why Pittsburgh was the favorite gathering place for emigrants from the East. After reaching Pittsburgh they constructed rude boats and

Photograph by E. J. Hall

The Mohawk Valley, New York. The most important of the four great natural highways leading through the mountains from the seacoast to the Mississippi Valley

floated down the Ohio. Each year, at the opening of spring, after the ice began to break on the river, scarcely a week went by in the early nineties but a score of flatboats, keel boats, dugouts, barges, and canoes passed down the river. The journey was beset with many dangers. The river was obstructed with floating trees and snags likely to wreck the boats, and Indians lurked along the banks with rifles ready to pick off the men without warning. The cabins of the boats were built low and lined with blankets and feather beds to protect the inmates from bullets.

This new country was undoubtedly rich in natural resources. But resources are of little value, beyond

supplying the necessities of life, unless a market is obtainable. Hence the next great difficulty in the way of the prosperity of the West was the lack of a market in which the settlers could sell their produce. To send it back across the mountains to Philadelphia or Baltimore was out of the question — that was a difficult journey for men unencumbered. The Mississippi River gave a natural outlet; but that was controlled by the Spanish.

The West was growing at a rapid rate. By 1790 Kentucky and Tennessee had over a hundred thousand inhabitants. They had come by way of Cumberland Gap, and their only trade routes were along the Mississippi and its tributaries. In vain did they plead with Congress to make a treaty with Spain which would give them the privilege of running boats down the Mississippi. Their plea was opposed especially by New England, because the West was drawing away its population. The settlers along the Mississippi and the Ohio were roused to fighting pitch when they saw their products go down the Mississippi only to be confiscated by the Spanish, and the owners of the vessels compelled to walk back home a thousand miles through the forest. Their rage was still greater when the United States made a treaty with Spain and ignored their petition. It was then that the West seriously considered separating from the East and joining the Spanish provinces, in order that they might have a market in which to sell their products. Conditions in the West fostered the love of individual liberty,

and settlers from the old states of Massachusetts or Virginia were ready to separate from their parent

From Mace's "School History"

Settlers moving west along the Cumberland Road on their way to new homes in the fertile blue-grass country of Kentucky and Tennessee

states and even to go to war with them when their rights and liberties were interfered with.

In 1794, however, a treaty was made with Spain which opened the Mississippi to citizens of the United States "to deposit their merchandise and effects at the port of New Orleans and to export them from thence without paying any other duty, than a fair price for the hire of the stores." The West could now send its produce to the outside world. But within a few years (1800) Spain lost her territory west of the river to France, and for a time it looked as if America would have to go to war with France.

Spain was a weak nation, and America had nothing to fear from her possessing the Mississippi Valley; but when France took this territory from Spain a real difficulty was presented. France was the most powerful nation in the world. President Jefferson said: "There is on the globe one single spot, the possessor of which is our national enemy. It is New Orleans, through which the produce of three eighths of our territory must pass to market, and from its fertility it will, ere long, yield more than one half of our whole produce and contain more than half our inhabitants." It is easy now to see that President Jefferson was right. It was necessary for the United States to own the land on both sides of the Mississippi. In 1803 this country purchased from France the vast territory known as Louisiana, in order that the western settlers might have the free navigation of the Mississippi.

The First Settlement in the Corn Country. When the public lands north of the Ohio River were taken

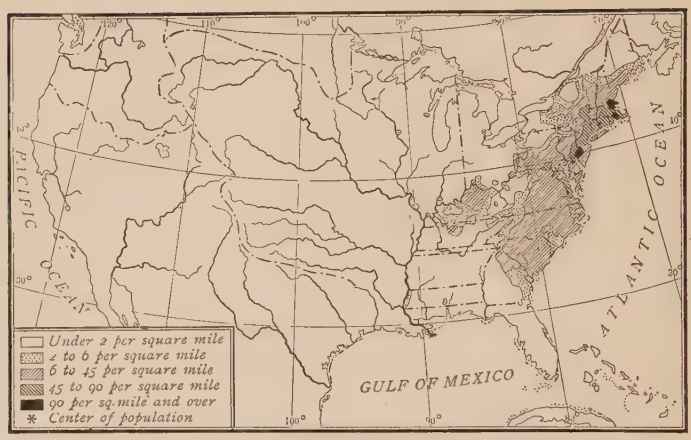
from the individual states and turned over to Congress, the old soldiers saw early prospects of receiving payment for their war services, and the nation saw a great revenue to be derived from the sale of land. Land companies immediately sprang into existence, chief of which was the Ohio Company, organized by Generals Rufus Putnam and Benjamin Tupper of Revolutionary fame. The Ohio Company had bought a million and a half acres of land, and private speculators more than twice as much. In 1788, the year after the organization of the Northwest Territory, a boatload of New Englanders sent out by the Ohio Company drifted down the Ohio River to the mouth of the Muskingum River, and landed in the wilderness a short distance up the Muskingum, opposite Fort Harmer. Rough boards taken from the boat made rude houses for the new settlers of this little village of Marietta. Such was the beginning of the settlement of the West by New England farmers and old soldiers. In the same year settlers crossed the Ohio from Kentucky and, being joined by other settlers from the East who had floated down the river from Pittsburgh, founded Cincinnati, which later became the capital of the Northwest Territory.

This was a wonderful country, and many remarkable stories of it were sent back to New England. It was referred to as a new land of promise, the garden spot of the world, the seat of great natural wealth, the center of a great empire. Immigrants were offered farms at a few shillings an acre, with

free transportation. Such glowing accounts and such attractive offers drew large numbers from the East.

As early as 1788–89 between eight and nine hundred boats went down the Ohio past Fort Harmer, or Marietta as it was now called, carrying as many as twenty thousand people, with about seven thousand horses, three thousand cows, nine thousand sheep, and six hundred wagons. The country far beyond the Mississippi stretched before these emigrants with a strange fascination. There was now no mountain barrier—nothing but the Indians to stop them in their journeys westward.

The Great Migration Westward. There is no period in the history of America more crowded with adventure and thrilling stories than the first quarter of the nineteenth century, when the people of the seaboard states awoke to the vast possibilities of the West. The period of distress which followed the Revolution and continued until after the adoption of the Constitution sent people westward in such numbers as threatened to depopulate the states along the seaboard. The greatest rush at first was into Kentucky and Tennessee. These settlers came largely from the states south of the Potomac River, and entered the West by way of the old Wilderness Road. At the close of the century there were 325,000 people in these two states, and more than 50,000 in the Northwest Territory. In 1800 the government adopted the method of selling the Ohio lands on credit. This, coupled with the high price of grain, sent thousands along


PACIFIC OCEAN
ATLANTIC OCEAN
GULF OF MEXICO
Under 2 per square mile
2 to 6 per square mile
6 to 45 per square mile
45 to 90 per square mile
90 per sq. mile and over
* Center of population

The United States at the beginning of the nineteenth century, showing the distribution of population per square mile and the center of population

the Mohawk Valley and the old Lancaster Road to Pittsburgh. Wheat in England was selling for $3.40 a bushel, and the inhabitants of Europe were facing starvation. These conditions made the price of bread in America continue to rise. At the same time fabulous stories of corn production came to the people along the seaboard from the land west of the mountains. The next year (1801) wheat went up to $3.50 a bushel in England. War was drawing the laborers from the fields of Europe, and the world's bread supply was short. Every small farmer, whose barren acres were covered with mortgages, whose debts pressed heavily upon him, or whose roving spirit gave him no peace, felt the call of the frontiers. The fertile valleys of the West lured him, and he became eager at once to

sell his homestead for what it would bring, save what he could from the general wreck, and begin life anew in the wild, free country of the West. "Westward ho!" was the cry; and so many heeded it that at the return of every spring hundreds of boats went down the Ohio, loaded with cattle and household goods. In 1800 Ohio had 45,365 settlers; three years later it became a state. In 1810 nearly a million people had found homes in the great West.

Still westward went the inhabitants from the seaboard; first into Ohio, then into Indiana. In 1810 there were only 24,520 inhabitants within the latter territory; ten years later there were 147,174. And still they moved westward. Through the state of Kentucky they came, as well, pouring across the Ohio River into Illinois and across the Mississippi into Missouri. By 1820 nearly another million had been added to the population of the West. At that time there were 55,000 settlers in Illinois and 66,000 in Missouri. At one time during the War of 1812 wheat was selling in Europe at four dollars a bushel, while the western farmers had corn, especially, in abundance, which they were willing to sell at ten cents a bushel. In 1814 the exodus from the seaboard became alarming. Old settlers in central New York declared they had never seen so many teams and sleighs loaded with women, children, and household goods. The period from 1800 to 1820 blocked out the work of expansion which the next two decades were occupied in completing.

Hardships endured. The conditions of trade,

commerce, and agriculture in the East kept growing worse. From Europe came the demand for more wheat. But wheat was not to be had. During the War of 1812 prices rose, and the supply along the seaboard was practically exhausted. For the first time since those stormy days of the Jamestown colony and the Puritan settlements the poorer classes of the East were facing a shortage of food and begging bread in the streets of the cities. Wheat was selling in New York at a dollar and a half, in Europe at four dollars. For the first time since the settlement of the seaboard, America was facing a distressingly short food supply. Wheat could not be relied upon, and it was the corn of America that kept the western continent from a great famine. No wonder the East was moving toward the West! New England and the Middle Atlantic States gave up their population in large numbers. The roads of New York were thronged winter and spring "with flitting families from the Eastern States." Men, women, and children walked all the way from Maine to the Ohio River, dragging their worldly goods and their babies in hand carts. The great exodus came in 1814. In this year flour was selling for ten dollars a barrel in Boston and Charleston. Despairing of better times at home, and lured on by the stories which came back from the West, the stream of emigrants increased. An almost continuous line of wagons, carts, and foot parties filled the highways and choked the ferries, so eager were the people to enter the great corn country.

It was a strange crowd that passed along the old Lancaster Road to Pittsburgh. It was a motley crowd, too, drawn from every eastern state and from every rank of life. One family from New Jersey, consisting of father, mother, and five children, walked the rough highway, carrying all their household goods in a wheelbarrow. A blacksmith from Rhode Island pushed a little cart containing some clothes

From "The Story of Chicago"

A typical tavern of the early West

and two small children, while the mother, with an infant at her breast and seven children beside, trudged on behind. Another couple with seven children straggled along, the man carrying all their property on his back. Five hundred emigrants a week passed through Albany in 1817; and by 1820 the tide was pouring across the Mississippi into the present state of Missouri. All roads westward were crowded. Inns and taverns sprang up along the

highways and did a thriving business; for many of the settlers were in a prosperous condition.

The emigrants not only went as individuals and by families, but whole villages and townships migrated together. A train of sixteen wagons from Maine, carrying one hundred twenty men, women, and children, with their pastor, passed through Massachusetts on the way to Indiana to buy a township. This company was not unlike that first Pilgrim band which had landed on the shore of Massachusetts nearly two hundred years before.

The old buffalo trails leading north and south, east and west, through the Blue Grass State were soon widened into roads by the foot parties and wagon trains that crossed either to the corn country beyond the Ohio River or to the cotton country far to the southwest.

Emigration from Europe. There was much distress in Europe at the close of the great wars of 1815. The eastern states of America had felt some of the hardship, but in Europe the suffering was far more severe. The fields of wheat and rye had been neglected and wasted; in many places the poorer people lived on roots, herbs, and nuts, and some starved. The fame of the great corn country west of the Appalachian Mountains reached these hungry Europeans. In the streets of European cities land agents told remarkable stories of this wonderful country where land was given away, where corn was produced in unlimited quantities, where bread was so plentiful that not even the dogs suffered

want. Scarcity of food in Europe, enormous taxes, and general depression of trade and commerce sent the middle class of England, Ireland, and Germany to our shores by the thousands. The argument was strong in favor of the New World. This was the beginning of that great immigration movement that was to add millions of Europeans to our population. It is said that thirty thousand foreigners came to America in 1817.

Effect of Migration on the States east of the Mountains. The migration from the seaboard was great and its effects were very noticeable. Towns and cities ceased to grow. The Southern States likewise lost heavily in population to the West and Southwest. Some of the finest cotton lands in all the world were to be found in Alabama, Mississippi, and Louisiana. These would produce also an abundance of corn. After Eli Whitney had invented the cotton gin and the textile factory had created the demand for the cotton of the South, the migration westward became tremendous. This was especially noticeable in the two decades from 1800 to 1820. Old worn-out lands of the Coastal States were abandoned. Small farmers and tenants unable to secure land along the seaboard turned toward the Southwest. Moreover, there was a strong anti-slavery sentiment in the piedmont sections of the South. The Quakers and others, true to their convictions, gave up their homes in the South and moved into the Northwest. It was said with much truth that it seemed as if Virginia and the Carolinas,

Tennessee, and even Kentucky, had agreed to pour their citizens into Missouri, Illinois, Indiana, and Ohio for the purpose of making the territories states. Day after day every ferry on the Ohio and the Mississippi was crowded with passing families, with their household goods, slaves, wagons, carts, and carriages. So great was the exodus that North Carolina and Virginia took measures to stop it. A committee of the General Assembly of Virginia made this interesting report:

"How many sad spectacles do her lowlands present of wasted and deserted fields, of dwellings abandoned by the proprietors, of churches in ruin! The fathers of the land are gone where another outlet to the ocean turns their thoughts from the place of their nativity and their affections from the country of their youth."

The New England States were alarmed and constantly opposed measures designed for the upbuilding of the West—an attitude which could not fail to cause friction.

The Distribution of Population. The following table shows the distribution of population in the states west of the mountains.

DISTRIBUTION OF POPULATION FROM 1790 TO 1820

STATE	1790	1800	1810	1820	ADMITTED AS STATE
Kentucky..	73,677	220,958	406,511	564,317	1792
Tennessee .	35,691	105,602	261,727	422,823	1796
Ohio.....	.....	45,653	230,760	581,434	1803
Indiana ...	.....	.....	24,520	147,178	1816
Illinois	.....	.....	12,282	55,211	1818
Missouri...	.....	.....	20,845	66,586	1821
Michigan ..	.....	.....	4,762	8,896	1837

This great movement of the population naturally turned the attention of the government toward the West—its future and its vast possibilities. The trade of the East saw the necessity of connecting with the agriculture of the West. The nation was beginning to face a great political issue—the provision of internal improvements to bring the corn country into connection with the markets of the East. How those early settlers lived in the West, and how the demand for better communication developed and was met, will be treated in the chapters which follow.

CHAPTER IX

Early Life in the Corn Country

Primitive Methods of tilling the Soil. When settlers from the Eastern States began to struggle with the Indians for possession of the fertile lands beyond the Appalachian Mountains, the only plows in use were made of wood, with sometimes a small point of iron tied on with rawhide straps. In those days agriculture was not considered a science, and

Courtesy of John Deere Plow Co.

The plow of the first western settlers was a pointed piece of iron fastened to a crooked stick

it is difficult for us to understand how the first tillers of the soil in the East or the West were able to make a living with their primitive tools, which did little more than scratch the surface of the soil. A few settlers had hoes made of iron, but as a rule the only tool in use was an ax. The first crops were planted and cultivated with no tools but a crooked stick, a bent piece of iron, and an ax. It was many years after the Pilgrims landed on the Massachusetts

coast before those early settlers had a plow. It is said that Boston was twelve years old before the wooden wedge fitted to a rough beam was used, and Ohio was about ready to become a state before the first iron plow was patented in America. Settlements had even reached the Mississippi River, and five new states had been carved out of the Northwest Territory, before the first adjustable plow was invented. Indeed, at that time it was commonly believed that an iron plow poisoned the soil and made the weeds grow!

Although wheat was the most desirable grain for

Courtesy of John Deere Plow Co.

A homemade plow. With a primitive tool like this some Illinois pioneers produced eighty bushels of corn to the acre

bread making, it was difficult to produce in a new country if the land had to be cleared of forest. When the pioneer reached the new country he built his house with the help of an ax and an auger, and cleared his land with an ax and a wooden hoe. At first he had nothing with which to cut his wheat when it was ready to harvest. So he pulled it up by the roots, threshed it with a flail, and winnowed it with a sheet. Where primitive methods of tilling

the soil were in use, corn soon became the most important crop. Even in half-tilled ground in the midst of dead tree stumps and roots, corn yielded an abundant crop. In Illinois the new land produced in some places eighty bushels to the acre, and in Ohio from forty to sixty bushels, whereas wheat yielded only from twenty to thirty bushels in the best-tilled land. A pioneer Methodist minister of Tennessee tells the following story of Indian corn in these early days.

When Corn was King. "When the country had to be redeemed from the Indians and the forests, Corn was King. The farmer who had plenty of corn had both bread and meat for himself and family. Suppose our fathers had had to depend on wheat for their bread! It would have taken them a hundred years longer to reach the Rockies. Only think of the pioneer in the woods depending on wheat for bread! Corn will produce four times as much as wheat per acre, and requires only one tenth of the seed to seed it down and only one third of the time from planting till it can be used for food. Wheat must have prepared soil, and be sown in the fall and watched and guarded for nine months before it is even ready to harvest; whereas a woman can take a 'sang hoe' in April and with a quart of seed plant a patch around a cabin and in six weeks she and the children can begin to eat roastin' ears; and when it gets too hard for that she can parch it. She needs to gather only what she uses for the day; for it will stand all winter, well protected by its waterproof

shuck. Not so with wheat. It must be all gathered at once when ripe, and threshed, cleaned, and garnered. And even then it is hard to get bread out of it without a mill. But a small sack of parched corn with a bit of salt was an ample supply for a ten days' hunt or a dash with Jack Sevier after thieving Indians. Corn was King when I was a boy."

And so it was. Corn was king when those hardy pioneers followed Boone into Kentucky and Clark into the prairie lands. Corn was king when General Putnam sent the first body of old Revolutionary soldiers into the Ohio Valley. And it was the power of this king of foods that sustained the thousands and hundreds of thousands of settlers who deserted the seaboard states for the magnificent river valleys of the West and Northwest.

Beginning of Western Civilization. The first men to enter this western country were hardy, strong of constitution, and of an adventurous disposition Think of a man who would push his worldly goods from Maine to Pittsburgh in a wheelbarrow! We are simply amazed at the thought of a woman walking the same distance, carrying an infant in her arms. Yet thousands who made the journey underwent such hardships and were sustained by a courage and fortitude that made the conquest of the forest a comparatively easy task.

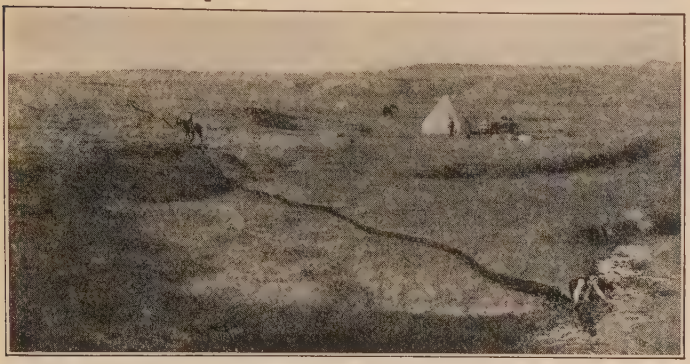
Within the three decades from 1790 to 1820, nearly two million people moved into Kentucky, Tennessee, Ohio, Indiana, Illinois, Michigan, and

Missouri. They came so fast that it was impossible to lay out roads; and to provide the conveniences of travel and commerce so necessary to the happiness and prosperity of a new country was out of the question. The inhabitants could grow food in abundance. In fact, living was so easy that a farmer need work but half his time to be able to supply an abundance of grain and meat for his family. But these pioneers were cut off entirely from the older settled sections in the East and the South.

A new country, if it would prosper rapidly, must be contiguous to an older community. Countries are like individuals in this respect; there must be a constant and easy interchange of ideas, products, and population. The Northwest had all the natural advantages for the forming of a great empire. It was being populated by a race of people who were nation makers. But it lacked one essential factor — easy communication with the outside world. The Appalachian Mountains made it impossible to connect the West with the East, and the nearest center of trade and culture in the South was New Orleans. But this port was fifteen hundred miles away, and it was easier for New York or Boston to trade with London than for Marietta or Cincinnati, Ohio, to trade with New Orleans.

Early Commerce. Even the roads leading from settlement to settlement were nothing more than narrow buffalo paths or Indian trails. The old military roads from the East to the West were at

first so cut up or so blocked by falling trees that it was next to impossible to cross the mountains with



A buffalo path. In pioneer days buffalo paths and Indian trails were the only roads leading from settlement to settlement

loaded wagons. Notwithstanding these difficulties, the early settlers had to import a few things from the outside world; they could not live on corn alone. Salt was required for their food; iron was necessary for their castings; and there was always a demand for spices, calicoes, and many household articles. But until the treaty with Spain in 1794, the settlers could not even go down the Mississippi River to trade.

After 1794 a multitude of rafts, arks, and barges floated down the Ohio and the Mississippi to New Orleans. It was not so difficult to float the products to that city, but it was slow, hard work to push the boats upstream from New Orleans to Pittsburgh. In fact, the round trip required sometimes twelve months. Therefore, it was often more profitable to sell the boats in New Orleans for old lumber and

walk back home, a distance of about fifteen hundred miles, and have their necessary supplies sent from Baltimore and Philadelphia by means of pack horses.

The Pack Horses. Philadelphia saw early the importance of trading with these settlers beyond the mountains, and a road from that city to Pittsburgh was begun. By 1784 goods were being carried from Philadelphia to Shippensburg, or Hagerstown, Maryland, in Conestoga[1] wagons, and thence taken to Pittsburgh on horseback. Philadelphia was fast drawing the trade of the West. A road across the mountains was being opened up along the old trail, over which settlers were continually traveling. Numerous inns and taverns were kept open, and in the busy season trains of pack horses were passing constantly, carrying hides and furs to the East and bringing in return salt and other necessities to the West. The important freight carriers in the earlier days were these pack horses, which moved in long lines, like caravans of camels across the desert. They have well been called the first industrial agents between the East and the West.

The earlier settlers collected what furs and pelts they could obtain throughout the year for the purpose of sending them over the mountains for barter. In the autumn the settlers brought together their goods and the horses were equipped for the journey. Each horse was provided with bell, collar, pack, saddle, and bags. These bags were

[1]Conestoga wagons were large, broad-wheeled wagons, usually covered, for travel in soft soil and on prairies. The name is derived from the town Conestoga, Pennsylvania.

filled with feed for the horses but on the return trip were used for salt. The first horse in each group was led by a driver, and each successive horse was hitched to the saddle of the one in front. When everything was in readiness, the long line of pack horses started from the Ohio across the mountains to Shippensburg or Hagerstown, Maryland, where they were to meet the wagons from Philadelphia. Here the furs were exchanged for salt, iron, and other merchandise. Bars of iron were often fastened on the backs of the horses and then bent around their bodies. Each horse carried in addition to other things two bushels of alum salt, which weighed eighty-four pounds. They also carried back to the land far beyond the mountains small packages of tea, chocolate, sugar, pepper, cinnamon, cloves, glass beads, hand mirrors, and the lighter iron goods. The caravans that went from the markets of the East to the great Northwest were not unlike those that came from India to Europe in the days when Venice and Genoa were carrying on an extensive commerce with the Far East.

From "The Story of Chicago"

Loading the pack horses

Effect of this Isolation on the West. Philadelphia was over three hundred miles from Pittsburgh, and about two hundred fifty miles from the nearest settlements in Virginia. In those days of slow transportation the West was so far removed from the East that the two had little in common, save a certain racial kinship, and even this bond had little force. Commerce is the great bond that unites people, and this bond was slight, indeed, in those early days when the corn lands were being opened up and pack horses were the only freight carriers.

The settlers sought earnestly for crops that could be sold abroad. Grain was too heavy and meat too bulky to send across the mountains on horseback. The westerners were forced, therefore, to adopt a kind of agriculture that would supply not only their food but meet also their other needs. As a result the bulk of the land was divided into small farms. Often, in the early years, the entire family dressed in deerskins, and later in sheepskins, but after a while flax was cultivated and the wheel and the loom were to be found in every home. Their isolation from the markets of the world made it necessary for the settlers to engage in such manufacturing as would supply their most urgent needs. This gave variety to their occupations. The vast timber lands furnished material for houses, rafts, and furniture, and by 1798 Pittsburgh was engaged in boat building. The household wheel and loom soon gave place to the factory. Small patches of cotton were planted

in Ohio, Indiana, and Illinois, and by 1809 Cincinnati had a cotton factory. Mills for grinding

An old water mill. To such mills the settlers brought their grain to be ground into flour or meal

grain, sawing lumber, and manufacturing furniture were erected, and woolen and hemp mills began to supply material for clothing.

The land produced food in abundance, but necessity drove a goodly number of the population into

converting the raw material at hand into articles suitable for use. Nail factories, glass factories, and iron furnaces were built. The West was learning from hard experience to become independent of the rest of the world. But there was little money in the section, and people carried on much of their trade by barter. It is said that in the Wabash Valley, where the castor-oil bean was very plentiful, merchants advertised that they would accept castor oil for debts.

The Source of Wealth. Notwithstanding the many industries which sprang up in the West, corn became the chief source of the wealth of this country. This was the one commodity that had a market value. In the first years of the nineteenth century the East was sorely in need of the grain of the West, as we have already seen, and Europe was crying in vain for bread. In Boston and Charleston flour rose at one time during the War of 1812 to fourteen dollars a barrel, while the grain of the West lay rotting in the fields because of the cost of transportation. To move a ton of grain from Pittsburgh to Philadelphia cost one hundred dollars. The freight on a barrel of flour across the country would have been about ten dollars. A bushel of salt sent to the West cost two dollars and a half, and a hundred pounds of sugar about five dollars. Nevertheless, the trade between the East and the West did develop and became enormous. A merchant class developed in the West, and the demand for money became still greater.

Much of the land in the Scioto Valley of Ohio was owned by settlers from Virginia who had been accustomed to raising cattle. The great cost of shipping grain to the markets of the world caused one George Renick, who had a considerable landed estate in the Scioto Valley, to fatten a lot of cattle in 1804 and drive them across the mountains to Baltimore, a distance of nearly three hundred miles. He was told that the long drive would either kill the cattle or so reduce their flesh that they would not be marketable. As he was obliged to have money wherewith to procure certain necessities of life and to pay his taxes, he tried the experiment. With careful treatment the cattle lost less than a hundred pounds apiece by the journey, and he found a ready market for them. His success encouraged others, and both Philadelphia and Baltimore became cattle markets. Fattening cattle on the corn of the West for the markets of the East became a most important industry. During March and April, three- or four-year-old cattle were fed heavily on corn. They were then allowed to graze all summer; then for five or six months, were fed on corn to give them solid flesh to stand the long journey. This began the following July, when the grass along the way would supply the cattle with food. The trip of three hundred miles across the mountains took fully a month. But at last a way had been found to turn the corn of the West into money, and for a time much of the corn raised in the West was used in this way.

It was easier to drive cattle than hogs to market, but it was cheaper to raise the hogs. It took from

Photograph by E. J. Hall

Cattle in a blue-grass pasture. The rich natural pasture lands of the Ohio Valley soon made the raising and fattening of cattle for the growing markets of the East an important industry

three to five years to get the cattle ready for market, but pigs could be fattened within twelve months. It required less skill and labor to handle the hogs but it was considerably more difficult to drive them such a great distance. It was not unusual to see a drove of five thousand hogs or three thousand cattle, accompanied by a group of horsemen, on their way to Baltimore or Philadelphia. Then, too, great droves of horses were raised for the markets of the East, and it is said that immediately following the War of 1812 more than one hundred thousand passed through Cumberland Gap on their way to the cotton fields of the South.

It is said that the practice of cutting corn and stacking it in the field was for the convenience of

the cattle raiser. Then the whole stack, corn and all, was fed to the cattle and horses, and the hogs were turned in later to eat the scattered grain.

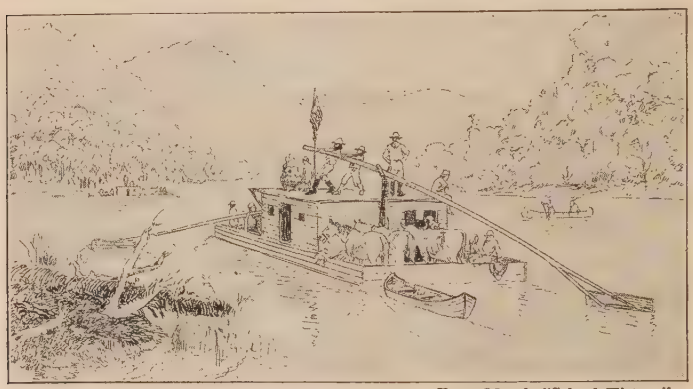
In all these ways the corn of the West was turned into wealth. Indian corn that could be bought in the fields for ten cents a bushel was at last bringing prosperity. It was being converted into cattle, hogs, and horses, and moved on foot to ready markets in the East.

Value of this Trade. This trade increased the desire of the eastern cities to open lines of communication between the East and the West. Philadelphia took the lead in constructing turnpikes, and by 1820 a line of wagons was running regularly between Philadelphia and Pittsburgh. More than three thousand wagons, transporting annually more than four million dollars worth of merchandise, carried on a lively traffic over the old Lancaster Road. Four, and sometimes six, horses pulled a heavy wagon as it creaked along the old rough roads that were still tramped by thousands of emigrants going into the corn country.

In addition to this overland trade thousands of boats, rafts, and barges floated down the Ohio and the Mississippi, carrying barrels of flour bound for New Orleans and for distribution to settlers along the way. Corn could not be transported a very great distance, since it molded quickly when shipped in bulk. Hence flour was carried by boat, and corn was converted into animals or whisky.

Floating Stores. New York, Philadelphia, and

Baltimore were making great efforts to reach this western country and draw trade to the East. In



From Mace's "School History"

A flatboat on the Ohio. The Ohio and the Mississippi were the most important highways in the new West. Thousands of flatboats loaded with products floated down them to New Orleans

the West no spur was needed. There all was bustle and hurry. Pittsburgh became the great distributing point, and at times several thousand emigrants, together with goods worth several million dollars, would collect in the city, waiting for the Ohio to rise so that they might go down the river. Settlers along the river watched for the boats from Pittsburgh to get news from the East and merchandise from Philadelphia and Baltimore. These demands gave rise to a new kind of conveyance.

A large vessel resembling a dwelling house soon appeared on the Ohio. It had counters and shelves piled high with "clothing and handsome furniture and kitchenware, china, crockery, shoes, and every sort of article and utensil of use in the household

or in the field." As this large floating store drifted down the Ohio, the owner, whenever it hove in sight of a dwelling, would begin to blow his horn. The settler would signal him, and when the store was made fast to the landing, men, women, and children would hurry to the river bank to barter pork, flour, and other produce for such goods as they needed or were tempted to buy. In this way the floating store made its way to Cincinnati and Louisville, where the produce was resold to merchants. The sound of the river horn brought joy to the settlers, and floating stores did a thriving business.

The National Turnpike. The wagon lines between Philadelphia and Pittsburgh were also reaping a rich harvest from the trade with the West. New York, however, felt the necessity of diverting the trade of the Great Lakes from Quebec and Montreal, and Baltimore began to look with envious eyes on the success of Philadelphia. The merchant class in the West developed slowly at first, because it was so difficult to obtain goods from the East or from New Orleans. The only way seemed to be overland, and to make this possible good roads were an absolute necessity.

Many plans for uniting the two sections had been discussed since the adoption of the Constitution, but it was not until Ohio was knocking at the door for admission into the Union that Congress took definite action. It was in 1802 that Congress agreed to spend a part of the net proceeds of the

sale of the public lands of Ohio in building roads, some of which were to lie within the state and others to join the Ohio River with navigable waters emptying into the Atlantic. The first great national highway was planned to begin at Cumberland on the Maryland side of the Potomac, and, crossing the mountains, to touch the Ohio near Wheeling in the present state of West Virginia. A large sum of money was immediately appropriated, but it was not until 1811 that construction began. In 1818 the road was completed to Wheeling.

This new road gave Baltimore a fine opportunity to reach the West. It became the highway for cattle and hogs driven from the Ohio Valley, and the market for bacon, beef, hides, and lard. The great turnpike was soon crowded with wagons carrying the merchandise of the East to the West, while the heavy produce of the West, such as flour, corn, and pork, was sent by boat to New Orleans and thence around the coast of Florida to Charleston and New York. Other roads to connect Baltimore and Cumberland, with the expectation of drawing much of the western trade from Philadelphia, were at once begun.

But a new era was at hand. The age of steam and of canal building was to form new commercial ties. A new industry, already begun, was to make the corn of the West more valuable to the world than was the cotton of the South, and to make the northern Mississippi Valley the granary of the world.

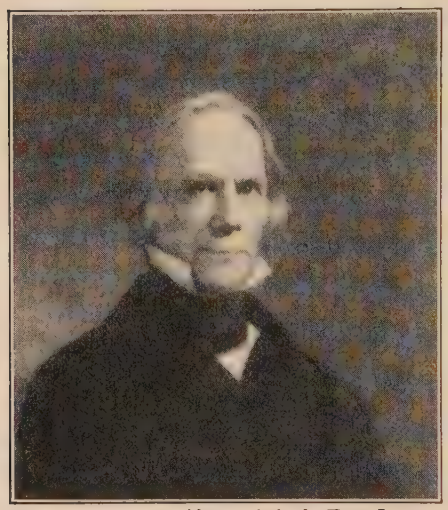
CHAPTER X

Connecting the Corn Country with the World

The Need of Internal Improvements. During the period from 1800 to 1820 over half a million people moved into Ohio alone, while nearly three hundred thousand more crossed the states of Ohio and Kentucky and found homes in Indiana, Illinois, Missouri, and Michigan. About three hundred fifty thousand more moved into the Southwest, into the present states of Alabama, Mississippi, and Louisiana, making a total of over a million people who in these twenty years crossed over from the seaboard to the land beyond the mountains. This migration caused the settlers to look back across the mountains and ask the East to help the West in uniting the two sections.

In 1803, when Ohio became a state, the first to be carved out of the Northwest Territory, her representatives became at once active for better means of communication between the East and the West. In 1806 Kentucky sent Henry Clay to the Senate. He was then barely thirty years old, but he at once brought the attention of the eastern statesmen to the condition and possibilities of the West. Clay was the first distinguished man to come from the great Mississippi Valley, and the West was extremely proud of him. He had seen the toil and trouble

which attended the emigrants from the East on their way to the fertile grain fields of the West, and when he entered Congress the cry for better means of communication was growing louder and more insistent. Some talked of great turnpikes, many discussed the need for canals, from which England had profited so much, and still others proposed river and harbor improvements. It seemed as if everybody was anxious to build roads, dig canals, and improve the river channels. But how? The states along the seaboard argued that it was the duty of each state to raise money for its own internal improvements; but the states west of the mountains wanted Congress to aid them in building roads that would connect the East with the West, and to help bear such other expenditures as would improve trade between the states.



After a painting by Henry Inman

Henry Clay, the first distinguished man sent from the Mississippi Valley to the United States Senate

Political Difficulties. Henry Clay was the champion of this policy in the Senate. In those days

most statesmen disapproved of Congress spending any money on internal improvements, on the ground that such a policy would lead to unjust discrimination. It was argued that if the government should begin to make these improvements for the benefit of the several states, it would favor those states that had the greatest power in Congress and that the practice might lead to the union of two or more sections for mutual advantage against other sections. Therefore, the policy of internal improvements did not at first make much headway in Congress. The West for the time was helpless, unable to connect with the great outside world. At this time a good turnpike across the mountains, or the improvement of the river channels, would have done much to improve conditions. But it was argued that the national government could not constitutionally appropriate money for public improvements, such as building roads, digging canals, and improving the rivers and harbors. In the meantime the West, cut off from the markets of the world, continued to fatten its cattle, hogs, and horses on its corn and drive them three hundred miles to market, while grain rotted in the field. Henry Clay, however, contended that the national government did have authority to make internal improvements. When he saw that Congress would not come to the aid of the West he predicted that the nation would soon be divided into three sections, the North, the South, and the West; and that each would eventually become independent of the others.

The great part that the grain fields were to play in the prosperity of the West was to be brought about not by national aid, but by the genius and skill of one man. Human ingenuity is greater than geographical barriers, and human skill was at that time already giving to the world a series of inventions destined to free the pent-up energy of the corn country. The first of these was the steamboat. And what could be more proper than a brief study of the man who made it possible for the products of the great corn country to reach the outside world?

After a painting by Benjamin West

Robert Fulton, builder of the first American steamboat. His invention resulted in changing the commercial habits of man and the policy of nations

Robert Fulton. The inventor of the steamboat, Robert Fulton, was born in Little Britain, Lancaster County, Pennsylvania, in 1765. His father died while he was quite young and, the family being poor, Robert was able to acquire only the rudiments of an education in school. His peculiar genius manifested itself at

a very early age, and he spent his hours of recreation in the shop of a mechanic or in the use of his pencil, for he was both mechanic and artist. When he became of age, in 1786, he purchased with his savings a small farm in Washington County, Pennsylvania, where he settled his widowed mother while he went to England to study art. In 1793 he conceived the idea of propelling vessels by steam, but it was not until seven years later that he turned his attention seriously to the construction of a steamboat. In the meantime he had become a civil engineer and had published several articles on canals. Having obtained patents on certain canal improvements, he went to France with the intention of introducing them into that country.

In Paris, in 1801, he met Chancellor Livingston, of New York, who had for some time been interested in steam navigation. The legislature of New York had already given Mr. Livingston the exclusive right to navigate steam vessels on all the waters within the jurisdiction of that state. After their meeting in Paris, the two men entered into partnership. In 1803 they built a boat with which they experimented on the Seine, but this was not a success and the French people took no further interest in it. A few years later Fulton left France and decided to try a new boat on the Hudson.

The "Clermont." In the spring of 1807 Fulton's first American steamboat, the *Clermont*, was lowered from the shipyard of Charles Brown, on the East River. The engine had been made in England,

to his order, by James Watt, the inventor of the steam engine. In August the boat was completed and was ready for trial. It was a success. The first trip to Albany is thus described by Fulton himself:

"My steamboat voyage to Albany and back has turned out rather more favorably than I had calculated. The distance from New York to Albany is 150 miles. I ran it up in thirty-two hours, and down in thirty hours. . . . The morning I left New York there were not perhaps twenty persons in the city who believed the boat would ever make one mile an hour or be of the least utility; and while our men were putting off from the wharf, which was crowded with spectators, I heard a number of sarcastic remarks. This is the way in which ignorant men compliment what they call philosophers and projectors. Having employed much time, money, and zeal in accomplishing this work, it gives me, as it will give you, great pleasure to see it answer my expectations. It will give a quick and cheap conveyance to the merchandise on the Mississippi, Missouri, and other rivers which are now laying open their treasures to the enterprise of our countrymen."

Soon after this successful voyage the Hudson River boat was advertised, and a regular passenger-boat service between New York and Albany established. Many who were engaged at that time in river navigation in the old way were hostile to Fulton's boat, and several attempts were made to destroy it. Notwithstanding these hindrances and the defects in the machinery, improvements were

made from time to time, and the boat continued to run as a packet, always loaded with passengers.

Steamboats on the Ohio. It was in 1811 that the first steamboat appeared on the Ohio. Nicholas J. Roosevelt was authorized by Livingston and Fulton to make an investigation of the currents of the Ohio and the Mississippi, and if in his opinion they were suited to steamboat navigation it was agreed to supply the capital for the construction of the boat. The report was favorable and Roosevelt was commissioned to go to Pittsburgh and build the boat. The little Ohio steamer was one hundred sixteen feet long and cost about thirty-eight thousand dollars. The people along the Ohio were just as skeptical as those along the Hudson had been when the *Clermont* started on its maiden trip. Although they saw the new boat move downstream, they were sure it could not move upstream. The falls at Louisville made it necessary for Roosevelt to wait a month for the river to rise. Meanwhile he turned his boat around and made it go upstream. Even then the people doubted. In fact, it looked too good to be true, for if the vessel could run upstream from New Orleans to Louisville, and from Louisville to Pittsburgh, the transportation problem would be solved. People thought that the boat, even if it could run upstream, would not be able to carry much freight, though it might be able to tow other boats or barges up the river.

Why the Steamboat was delayed. Although boats were soon making the trip from New Orleans to

Louisville and from Louisville to Pittsburgh, business did not prosper. Rival companies sprang up, and both these and the Fulton company attempted to control the navigation of the more important streams. Feeling became very bitter. Moreover, Fulton's company had secured the exclusive right from the state of Louisiana to navigate the waters of that state, and this gave rise to another perplexing question: Did the state have the right to control the navigation of streams that flowed through the state? If so, Louisiana had it in her power to injure the commerce of the states drained by the Mississippi River and its tributaries. Ohio especially became alarmed, because all the produce of the Northwest was beginning to go down the Mississippi. One of the vessels of a rival company was seized by a warrant issued at the request of the Fulton company and a long lawsuit followed. It was decided in 1818 that Louisiana had exceeded her power. But it was not until 1824 that the Supreme Court of the United States settled the whole dispute by declaring that Congress alone had power to regulate commerce between the states. This was one of the most important cases ever decided, since it opened the way for Congress to appropriate money for river improvement. To-day the rivers running through the states are controlled by Congress and not by the states, and millions of dollars are spent annually by Congress for river improvements.

After 1824 the steamboat business began to develop and many companies were formed to build

and navigate steamboats. It was in the steamboat business that Cornelius Vanderbilt laid the foundation for the great wealth of the Vanderbilt family.

Although every country and every section prospered greatly by this successful invention, the Mississippi Valley was affected probably more than any other section of the globe. Its sixteen thousand miles of navigable water, extending into every section of the great valley, brought out the grain to the markets of the world. It is said that by 1840, when steamers began to make regular trips across the ocean, there were over a thousand steamboats on the Mississippi and its tributaries.

Effect of the Steamboat. When the West was first settled and the world was needing its surplus food, the fixed policy of the nation was that the government had no power or authority to take money from the national treasury for roads, canals, or any other form of internal improvement. But the new invention, the steamboat, so changed the commercial habits of man that the policy of the nation was changed. The Supreme Court first decided that Congress had the right to control the navigation of the streams. This right carried with it the obligation to make navigation possible; therefore, Congress had the authority to spend money in improving national waterways. Hence it was easy to see that Congress had the right to construct waterways, and soon public money was expended in building canals. If Congress had the

power to improve and construct waterways, it had the power to improve the harbors along the coast.

Wing dams built by the government at Gray Cloud Island in the Mississippi River. These dams make possible the navigation of this part of the river

Therefore we have coast surveys, lighthouses, harbor improvements, and life-saving stations supported by the nation. The appropriation of money for internal improvements, once begun, has gone on at a rapid pace. When the railroad came, Congress gave land and appropriated money for it. National parks have also been secured. At present, plans are on foot for the construction of an inland waterway that was first proposed more than a hundred years ago.

The fear of being shut out from the world determined the policy of the first settlers of the West.

Their representatives fought in every Congress for some recognition by the East of the policy of internal improvements at national expense. But Henry Clay and all the statesmen of the West could not accomplish with their eloquence what Fulton accomplished with his steamboat. The little boat launched on the Ohio River in 1811 was destined to do for the Northwest what the cotton gin did for the South. It now became possible for the corn country to market its produce in the ports of the world. From the day that little vessel paddled its way down the Ohio, puffing, snorting, frightening alike settlers, Indians, and cattle, until the present time, the products of the corn country have been important factors in the food supply of the world, and have made the Mississippi Valley the "body of the nation" and the center of the nation's wealth.

The Mississippi Valley. Let us examine more closely the geography of the Mississippi Valley. Observe the vast area between the Appalachian and the Rocky mountains! The little streams that trickle down the westerly slopes of southwestern New York, and the cool waters that come from snow-capped peaks in Colorado, more than two thousand miles apart, meet in the great "Father of Waters" and together flow down into the Gulf very near the torrid zone. This is the most important river valley in the world. Embracing, as it does, nearly one half the area of the United States or about a million and a quarter square miles, it exceeds in extent the whole of Europe, exclusive of Russia, Norway,

Sweden, and Germany. The northern half of the valley is the greatest food-producing country in the world, and the southern half is a part of the great cotton country of the world. Yet geographically the two are one. The coming of the steamboat united the two sections commercially, since the corn of the northern half of the valley found a ready market in the South and the cotton of the South found many markets in the valley of the Ohio.

The Mississippi River. The Mississippi River and its tributaries are the great arteries of this "body of the nation," and during the first half of the nineteenth century were the great highways of trade into the corn country. Beginning with the source of the Missouri, which lies in the mountains of northwestern Montana, its waters flow through the north temperate zone and pass into the Gulf of Mexico after a course of about forty-five hundred miles—a distance equal to nearly one fifth of the circumference of the globe. The Mississippi has about two hundred fifty tributaries, which drain an area stretching from the state of New York to Idaho, and from Canada to the Gulf. This mighty river system drains the fields and forests of twenty-five states. It is easy to see, therefore, that the appearance of the steamboat on those waters would make a wonderful difference in the life of the people.

But the navigation of the rivers was beset with many difficulties. The Mississippi-Missouri is not only the longest river in the world but it is likewise the most crooked. The waters of the Mississippi

alone travel from its source about three thousand miles before they reach the Gulf, whereas the air-

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A scene along the Mississippi River near its source at Lake Itasca

line distance is only about one thousand three hundred miles. No two surveys of the course of the river made at different periods have recorded the same length. The measurements sometimes vary as much as two hundred or three hundred miles. This wonderful river has been known to cut across the country in a night, shortening its course by thirty miles. It has swept around obstructions and left its old bed far inland. It has played havoc

with boundary lines—land once in Arkansas is to-day in Mississippi, and vice versa. It has made and unmade towns along its banks. It is said that a town in the state of Mississippi used to be three miles below Vicksburg as the river then ran, but to-day it is two miles above Vicksburg as the river now runs. It has thrown river towns far inland, and villages that once lay on its banks and listened to the shrill whistle of the river steamboats have disappeared, and the mighty river flows over the places where once the church bells called the people

From Mississippi River Commission, U. S. War Dept.

Levee along the Mississippi. To prevent the flooding of the low lands in time of high water the banks have been strengthened by levees of earth and stone

to worship, and the busy traffic of streets marked the industry of a thriving river town. When the

steamboat came it found here about sixteen thousand miles of navigable waters, and a steamer plying its way from the Gulf to the falls of the Missouri covered a distance of over four thousand miles—a distance greater than that from New York to Constantinople. Steamers could work their way into the heart of Tennessee or Kentucky, run far inland in all the states north of the Ohio, almost touch the Canada line, and find their way to the foothills of the Rocky Mountains. No other such area in all the world has received so much from the hand of nature.

Such is the wonderful valley and such is the mighty river that had witnessed the civilization of the mound builders, the rude culture of Hiawatha's tribe, and the coming of the buffalo. It was the settlers from the East, however, crossing the mountains by following the trail of the Indian and the buffalo, who had the genius to feel the promise of this great river basin. The river valleys of the world have produced the greatest civilizations, and it was from ' the struggle for mastery of this great valley that there emerged a new democracy unlike anything yet seen," and from the beginning of that conquest to the present time all important questions of the nation have been solved with reference to this great valley.

How the Great Valley was unified. It is easy to see that steam, once fully established on the Mississippi and its tributaries, would bind together the corn country and the cotton country, and by 1824

this union had become a fact. In 1814 the first steamboat made a successful trip from New Orleans to Louisville. This was the beginning of a new era in the West, since passenger travel was greatly facilitated and freight steamers could now ascend and descend the river. The passenger rates from Pittsburgh to New Orleans, which had been sixty dollars, were gradually reduced to about one half that amount, and the time required to make the trip, from four months to less than one third that time. Freight rates were likewise soon reduced about one half. In 1819 sixty boats were running between New Orleans and Louisville. When the Cumberland River was opened, a line of boats was established between Nashville, Tennessee, and New Orleans. The Missouri and the Platte were opened, and boats were soon creeping up to the foothills of the Rocky Mountains; the tributaries of the Ohio were opened, and steamers were soon puffing and blowing in the very heart of the grain country.

By 1815 Cincinnati had become a good deal of a trade center. Corn, wheat, flour, pork, bacon, lard, and whisky, all products of the grain of the Northwest, were going down the Mississippi to New Orleans and beyond. St. Louis had established communication with Louisville, Cincinnati, and New Orleans. The rapid development of steamboat traffic was destroying the wagon trade between Philadelphia and Pittsburgh and drawing together the West and the South.

It was the period from 1820 to 1850 that witnessed

the great development of steamboat traffic of the Mississippi Valley. Coal was easily obtained for fuel, as there was an abundance of it in the valley. By 1826, Cincinnati had become the chief exporting city and the manufacturing center of the West. As many as thirty steamers might be seen any

Photograph by E. J. Hall

A Mississippi River steamer. The steamboat bound together the corn country and the cotton country, making of the Mississippi Valley an empire complete within itself

day at the docks of this metropolis of the valley. Louisville, also, became a great exporting center, controlling as it did the products of central Tennessee and Kentucky that came by way of the Cumberland River. In addition to steamboats, thousands of rafts, boats, and barges floated down the northern tributaries of the Mississippi. Coming together at the mouth of the Ohio, numbers of these were lashed

together and proceeded down the Mississippi to New Orleans. After disposing of the products the raftsmen worked their way back home, sometimes as deck hands on the steamers that carried the merchandise of the world to the great grain country of the Northwest. In 1824 three hundred thousand barrels of flour went down the Mississippi, and on the return trip the boats were loaded with cotton. The portion of the South drained by the Mississippi was beginning to depend upon the West for food, and the West was depending upon the South for material for clothing. By 1840 three thousand flatboats, in addition to the steamboats, annually ascended the Ohio alone, and probably as many more went down the Mississippi. Thus it had come to pass that the great Mississippi Valley was an empire complete within itself. What a change since those early pioneering days when pack horses were the chief freight carriers between the East and the West!

CHAPTER XI

An Era of Internal Improvements

Dependence of the West upon the South. If you will examine your maps again, you will see that New Orleans was the natural market for the grain of the entire Mississippi Valley. But grain bound for Charleston or New York, the West Indies or South America, England or the continent of Europe, had to be reloaded at New Orleans. The grain country, however, was developing so rapidly and commerce was increasing at such an enormous rate that New Orleans soon became unable to handle the freight. There were not enough warehouses in which to store the grain and not enough ocean-going vessels to take it away. By 1825 the market was overstocked and traders had either to wait in New Orleans for prices to rise or else leave their goods stored in crowded warehouses where they were liable to spoil. Seagoing vessels were unable to take the products away fast enough, although flour was selling in New York and Charleston at eight dollars a barrel while in Cincinnati it was three dollars and a half.

New Orleans was far from the leading markets of the world and ocean travel was slow and uncertain, since steamboats or steam vessels had not yet taken the place of the old sailing vessels. The greater

number of the Southern States were raising a sufficient food supply for their own consumption, and there was little demand in the South for the tremendous grain products of the West. The Northwest was near to the markets of the East, yet the products of the West were too heavy and bulky to be sent overland. Again and again the West looked to New York, Philadelphia, and Baltimore, where the demand was great and prices high, but the only way the grain could reach these cities was by converting it into hogs, cattle, and horses, and driving them over the mountains.

As steamboat transportation increased in the Mississippi Valley the wagon trade across the mountains declined. But the great trading centers of the East were in need of the cheaper food that could be found in practically unlimited quantities in the Mississippi Valley. Such a demand was sure to find an answer, and did find it in the era of canal building which now followed.

The Era of Canal Building. Turnpikes were insufficient. Water transportation was the cheapest, and waterways must be made between the East and the West. But the great Appalachian Mountains stood a grim barrier, obstructing turnpike and waterway, while grain rotted in the bins of the West and people almost starved in the cities of Europe. Hence the people of every state were talking canals. New York was most fortunate in its location, since there was a natural trough extending across the state from the Hudson River to the

Great Lakes. This is the old Hudson-Mohawk route, referred to in another chapter, and through this trough it is said the Great Lakes once emptied their waters into the ocean. Governor Clinton of New York argued that a canal could be dug without much difficulty along this natural highway.

Surveys were made in 1808, and the one practicable route that could be opened by canal was laid out. On account of the War of 1812, however, the canal was not begun until 1817. The nearest route would have been from the Hudson River to Lake Ontario, but this would have made necessary another channel around Niagara Falls. It was, therefore, decided to build to Lake Erie, a distance of two hundred sixty-three miles. In that way New York might draw all the trade from the Great Lakes region.

Opening of the Erie Canal. No event in the history of America has surpassed in lasting importance the completion of the Erie Canal. After eight years of persistent labor the "Big Ditch," as it was called, connecting Lake Erie, at Buffalo, with the Hudson, at Albany, was finished at a cost of about $20,000 a mile, and on June 26, 1825, the celebration of the opening began. A line of canal boats with the *Seneca Chief* in front drawn by four gray horses started from Lake Erie to the river. A bear, two eagles, two fawns, two Indian boys, and some fish—all typical of the natural products of the West—were carried on this trip. As the fleet moved along the canal it was

saluted with music, the cheering of crowds, and the firing of guns. Lake Erie and all the fertile country of the Northwest was at last joined with the markets of the East. When the line of boats reached Albany an escort of gayly decorated steamboats accompanied the fleet down the Hudson to New York, where the entire city, together with thirty thousand visitors, turned out to welcome it. The *Seneca Chief* had brought a keg of lake water, which Governor Clinton with much ceremony poured into the ocean, typifying the union of the Great Lakes and the Atlantic Ocean.

The canal, the completion of which was celebrated with so much ceremony by the people of New York, was in truth little more than a big ditch. It was only four feet deep and forty feet wide, and the distance from Buffalo to New York was two hundred sixty-three miles. Two years before the opening of the Erie Canal another canal had been completed from the Hudson to Lake Champlain. The opening of these two waterways was the beginning of a new era in the development of the state of New York and especially of New York City. Pent-up trade broke loose, and in the year following the opening nearly twenty thousand boats and rafts passed West Troy. The Erie Canal was a tremendous success from the very beginning. The tolls and duties of the first year amounted to more than a million dollars.

As section after section of this much-needed waterway was completed a mania for internal

improvements swept over the country, and many long-discussed projects began to take shape one by one. The Delaware & Hudson Canal was begun in July of 1825 and the Delaware & Chesapeake Canal was well under way at that time. The Chesapeake & Ohio Canal was about to be commenced, while plans were on foot to join New Haven with Northampton, Providence with Rochester, Boston with the Connecticut River, and Long Island with Montreal by way of the Connecticut River.

The Ohio Canal. In the year that New York celebrated the opening of the Erie Canal the farmers of Ohio became active. They had already seen the necessity of connecting the Ohio River with the Great Lakes in order that the grain of the interior of the state might be sold in the markets of New York. The geography of Ohio was favorable to canal building.

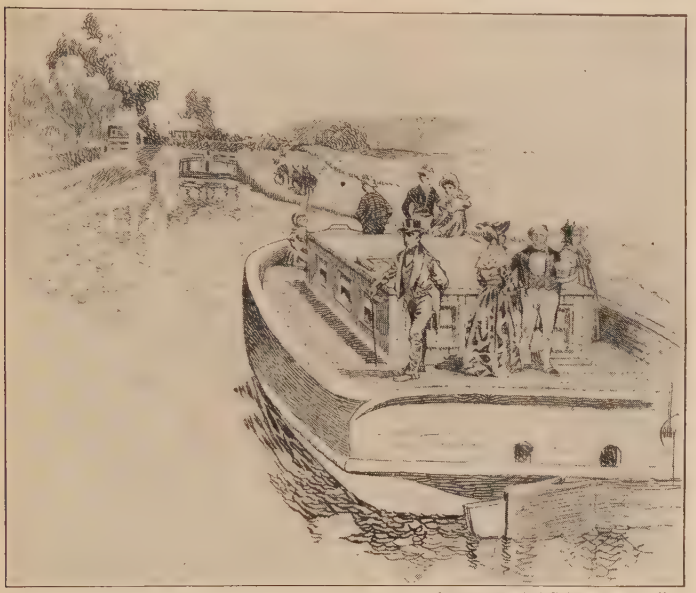
The Cuyahoga River, which empties into the Great Lakes at Cleveland, and the Scioto and the Muskingum, which join the Ohio, traversed at that time the most thickly settled sections of the state. In 1825 it was decided to connect these rivers with a canal, afterwards known as the Ohio Canal. In that same year the national government spent seventy thousand dollars on the improvement of the Ohio River. A canal was also in course of construction around the falls at Louisville. This was completed in 1830, and two years later the Ohio Canal, three hundred nine miles in length, was opened. At last the Mississippi Valley was

connected with New York. Steamboats had already appeared on the Great Lakes, and an easy communication was now opened between New York, the metropolis of the East, and Cincinnati, the metropolis of the West.

Effect of these Canals on the West. It became evident at once that the system of canals connecting the waters of the Northwest with the Hudson River and the Atlantic Ocean would turn much of the commerce of this country into the port of New York, thus making the Erie Canal one of the great highways of America. The farmers living inland took immediate interest in these waterways, which were far better than roads and of more service to the interior than were the rivers. A farmer could build a good strong boat, capable of carrying twenty-five tons, for about one hundred dollars. Into this he could put his corn, flour, and meat, hitch his horse to it, by means of towlines, and draw the whole cargo to the leading port of the Great Lakes.

Sometimes the boats were drawn by men, instead of horses, walking along the towpath. Sometimes they were public carriers and were supplied with staterooms and conveniences for travel. On the Erie Canal there was considerable passenger travel. Here the boats were larger, usually about eighty feet long by eleven feet wide, carrying on deck "a long, low house with a flat roof and sloping sides, which were pierced by a continuous row of windows provided with green blinds and red curtains."

Frequently the number of passengers far exceeded the number of berths, and in such cases the men



From Mace's "School History"

In 1825 the Erie Canal not only furnished cheap and easy means for shipping foodstuffs from the West to the East, but was a popular route for travelers

usually slept on the dining table or on the decks. "When the weather was fine, the travelers gathered on the roof, reading, sewing, talking, and playing cards, till the helmsman would shout, 'Bridge! Bridge!' Then the assembled company would rush headlong down the steps and into the cabin, to come forth anew when the bridge had been passed." The rate of travel was very slow. A boat the size of the one described above was usually drawn by

three horses, walking one behind the other, at the rate of about four miles an hour.

Slow as this means of commerce was, it meant the moving of the products of the West to another world market—the beginning of a mighty—a stupendous—stream of trade, the volume of which no one dreamed.

Effect of these Canals on the East. The cities of the East were making vigorous efforts to draw the great grain and meat trade from the Northwest. As soon as the waterway from New York to the Ohio River was completed, the grain of the West started for New York. In 1835, three years after the opening of the Ohio Canal, eighty-six thousand bushels of wheat were towed from the Ohio River up the Ohio Canal to Cleveland. Here it was put on board steamers and carried to Buffalo, where it was reloaded into canal boats and taken to New York. In this same year 1,354,995 bushels of wheat and 96,233 barrels of flour went from the state of Ohio to the East. In a short time the Welland Canal connecting Lake Erie and Lake Ontario opened other markets along the St. Lawrence for the grain of the Northwest.

The growth of the cities in the East made such heavy demands upon the surrounding country that the farmers were no longer able to supply the necessary foodstuff. Then, too, by 1830, New England had no frontiers. The rocky hillsides were being deserted for the towns or for the fertile fields of the West. The cost of living was growing higher

and higher. But the opening of the canals from New York to the Great Lakes and from the Great Lakes to the Ohio changed this. The markets of the East were being connected with the grain fields of the West. No wonder the people of New York crowded along the new canal, waving their hats and shouting for joy, when the first boats passed by carrying grain from the West to the East! No wonder the Ohio farmers gathered on the banks of the Ohio Canal and poured their produce into the queer-shaped boats, hurrahing lustily as the corn and meat of the West started for the cities of the East! In 1824 corn sold for ten cents and wheat for thirty cents a bushel in Ohio, while in New York the prices were three or four times those amounts. Soon after the opening of these canals, however, the prices in Ohio were doubled and quadrupled while in New York they fell considerably.

Thus new routes of trade were opened up, bringing the East and the West together. The great corn country was at last opened to the markets of the East. It is easy now to see how important and how necessary the Ohio Valley is to the states along the Atlantic Coast. But suppose the French had been victorious instead of the English! Suppose the Appalachian Mountains had remained the western boundary line of the states along the seaboard! How vastly different would have been our history!

Effect of these Canals on the Mississippi Trade. The opening of these canals, however, did not affect the corn trade of the Mississippi and the South.

Already the corn country had developed so rapidly that neither the river commerce nor the markets of the South alone could handle the product. Moreover, the canals were shallow and the boats small. They could compete but little with the heavy steamers along the rivers. By 1832 Cincinnati had become the "Queen City of the West," with a population of about twenty-five thousand. And its growth was due in large measure to the Mississippi River trade. Great pork-packing establishments were developed, giving to Cincinnati the name "Porkopolis." When the canals were opened the river trade was greater than the trade of the whole country in 1790, the year when the West was first opened.

Continued Growth of the Corn Country. The invention and development of the steamboat, together with the improvement of the streams for navigation, had sent the greater part of the produce of the grain country into the cotton country. The opening of canals connecting the Ohio River with New York turned much of the surplus grain from the interior to eastern ports, and advertised this remarkable western country throughout the Eastern States. It was much easier now for settlers to reach the free lands of the West. Turnpikes and canals had facilitated travel considerably, and a steady stream of population flowed westward. Old Indian trails had been widened into roads, and the Erie Canal became a great highway for settlers seeking the West. At certain seasons of the year every

highway leading into the corn country was filled with prospective settlers, who were willing to endure many hardships in order to reach the wonderful corn country. The following table tells the story of the migration:

MOVEMENT OF POPULATION WESTWARD FROM 1820 TO 1850

STATE	1820	1830	1840	1850
Ohio	581,295	957,903	1,519,467	1,988,329
Indiana	147,178	343,031	685,866	988,416
Illinois	55,162	157,445	476,183	851,470
Michigan	8,765	31,639	212,267	397,654
Wisconsin	.....	.....	30,945	305,391
Iowa	.....	.....	43,112	192,214
Minnesota	.....	.....	.....	6,077
Missouri	66,567	140,455	383,702	582,044
Kentucky	564,135	687,917	779,824	982,405
Tennessee	422,771	681,904	829,210	1,002,717
Alabama	127,901	309,527	590,756	771,623
Mississippi	75,448	136,621	375,651	606,526
Louisiana	152,923	215,739	352,411	517,762
Arkansas	.....	30,388	97,574	209,897
Texas	.....	.....	.....	212,592

By 1850 Ohio had a larger population than Massachusetts. In fact, its population was almost equal to that of all the other New England States combined. Michigan had a population greater than that of any New England state except Massachusetts. To a considerable extent the emigration that came from different sections of New England followed parallel lines. By 1840 New England had practically ceased to grow. In the next decade many towns and districts lost heavily in population, and a number of them have never recovered from the loss.

The period of the greatest emigration from the South was, however, from 1830 to 1840. It was

even greater than that from New England a decade later. Virginia, North Carolina, and South Carolina remained practically stationary, while Alabama, Mississippi, and Louisiana grew almost as rapidly as did the Northwestern States. No considerable area of the West was now cut off from a market, for one could be reached either by way of the Mississippi to the Gulf or lower South, or else by way of canals and the Great Lakes to Buffalo and New York.

Immigration from Europe began to increase rapidly after 1830, and it was especially large during the years 1845–1850, which were marked by famine in Ireland and by a revolution on the Continent. The average annual influx during this period was three hundred thousand. These were at first distributed throughout New York, Massachusetts, and Pennsylvania, but they, too, soon followed the western routes. This was especially true of the Germans, who settled in the country north of the Ohio.

Westward and northward flowed this ceaseless stream of immigrants, across the Mississippi, up the Missouri, along the Great Lakes, until the wave reached the Red River, where the waters run toward the Arctic circle. Here Minnesota, the northernmost of the great grain states between the Missouri and the Ohio, began to take shape. In 1850 Minnesota had over six thousand inhabitants.

The Grain of the West. The growth of the Northwest and the development of the trade in foodstuffs is one of the marvels of the nineteenth century. So rapidly did the settlers open up

new lands, and so fertile were these virgin fields, that notwithstanding the improvements made in transportation it was impossible to move all the grain to the markets of the world where it was so greatly needed. Corn was becoming more and more valuable, not as an article of export but as a food for cattle and hogs, and the business of driving cattle and hogs to Baltimore and Philadelphia increased in volume every year. During the financial panics that occurred periodically between 1820 and 1850 the cattle trade between the East and the West ranked as one of the chief resources of the West, always commanding ready money regardless of hard times. By 1835 a general interest in the improvement of stock took hold of the people of the West, although the farmers of Kentucky and Ohio had long been improving cattle for breeding purposes. The cattle trade became so profitable that the ranchmen of Texas drove their steers more than a thousand miles to Ohio, where they were fattened on corn for the markets of the East.

The corn of the West was also turned into pork, and the business of driving hogs to the markets of the East increased likewise, although Cincinnati had early begun to pack pork for the Mississippi Valley. As the raising of corn was now rapidly declining in the East, the meat supply also decreased. At this period Cincinnati became the great meat market of America and cargoes of pork went by way of the canals and the Great Lakes to eastern markets. American pork, however, did not become

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Texas cattle on their way to the corn country to be fattened for eastern markets

an article of much export value until near the middle of the century. One reason given for this was that American packers did not preserve it properly for the long voyage. Senator Benton of Missouri said, however, that the tariff on salt held back the pork trade for about three decades. In 1813, during the second war with England, Congress levied a tax of twenty cents a bushel on alum salt, which was continued until 1830. Only alum salt could be used in preparing pork for foreign trade, and this tariff on it worked a hardship to the West. It is interesting to note here that the fish markets of New England also used alum salt. But according to Senator Benton, Congress paid them a rebate which about equalized this duty, and indeed, at one time practically the entire duty paid on this salt went to New England as a bounty. In 1814 this

salt cost about three dollars a bushel, and later as much as five dollars. In 1832 the tax was reduced, the grain of the West took another form, and Cincinnati taught the world the business of pork packing.

How the World was needing the Grain of the West. It is difficult for us to appreciate the tremendous importance of corn in the world's history. The world could not depend upon wheat. It was an unreliable crop, and the civilized world did not produce at any one time a sufficient quantity. A wet harvest always caused a small crop and sometimes a famine. As England depended almost entirely on wheat, the food question was ever present in Parliament. Richard Cobden said in 1841: "When I go down to the manufacturing districts I know that I shall be returning to a gloomy scene. I know that starvation is stalking through the land and men are perishing for want of the barest necessities of life . . . . There are a thousand homes in England at this moment where wives, mothers, and children are dying of hunger." He pleaded with Parliament to take off the tariff and let in American grain free of duty.

Russia, Belgium, and Holland had suspended all duties on grain by 1845, but the famine in England continued. It was especially severe in Ireland. Yet it was not until 1846 that the import tax on grain was removed. The year before this act was passed, Robert Peel, the English prime minister, bought Indian corn, amounting in value to £100,000, in America, and shipped it to Ireland. It was called

by the Irish "Peel's brimstone." That was the beginning of the European trade in Indian corn.

At last the nations of Europe had removed the tariff on foodstuff and were calling for the grain of the West. But transportation was still slow and facilities inadequate to handle the business. While corn and wheat were rotting in the fields of the West, bread could not be bought at any price in certain European cities.

But another era was at hand. An invention had given an impetus to land transportation—the railroad was slowly creeping westward. When the railroad bound the cities of the East to the grain fields of the West, a new chapter began in the world's history.

CHAPTER XII

Railroads: Completing the Connection of the Corn Country with the Markets of the East

The Problem. The grain of the West was necessary not only to the welfare of the East but also to the welfare of European nations. No other section in all the world was producing or could produce food to spare in such immense quantities, and only a few were producing enough for their own immediate needs. We have already seen that food was frequently scarce in New England and the Middle Atlantic States; that people in the cities and manufacturing centers of Europe were frequently facing starvation. At the same time there was more grain in the northern Mississippi Valley than could be hauled away. It was evident, therefore, that the Mississippi River, although uniting commercially the grain and cotton countries, did not give the best outlet for the surplus grain.

You will observe that the Mississippi River runs toward the equator. Therefore, it does not run toward the great markets of the world. But direct trade routes to the corn country were now being demanded. And how to open these direct trade lines to the West was now the problem. Canals had offered a seeming solution, but they soon proved to be

unequal to the task. The one great barrier to trade and to the world's progress was the Appalachian Mountains. The strength of a people, however, is measured by their ability to overcome geographical barriers. Again one man became the world's benefactor. A second great invention came to revolutionize land traffic.

The Coming of the Railroad. While Fulton was completing his first steamboat and New York was surveying the canal route from the Hudson River to the Great Lakes, a young engineer employed in one of the coal mines at Killingsworth, England, was experimenting with a steam engine. He was trying it out to see if it could be used to pull wagons loaded with coal from the coal pits to the shipping stations.

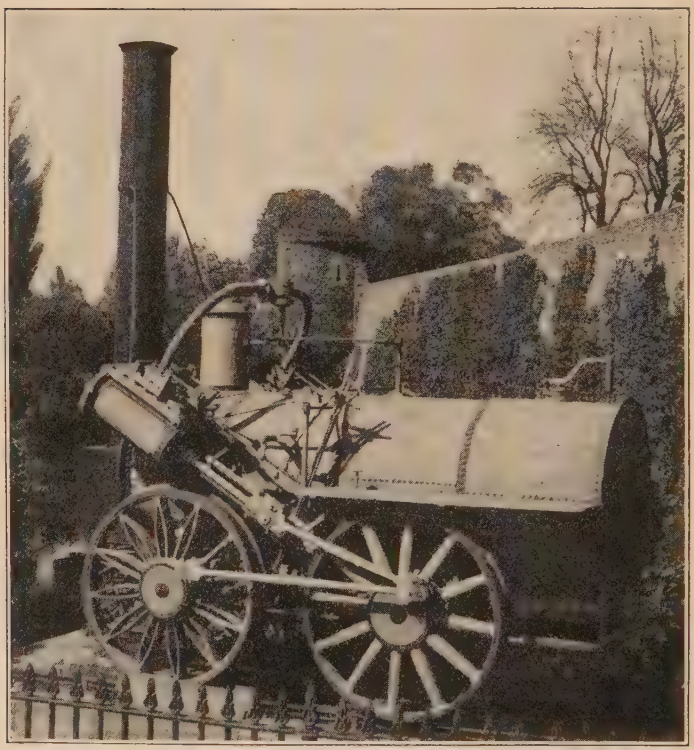
Railways had long been in use. At first they consisted of a rough line of wooden rails laid down for the easy guidance of wagons in which freight was hauled by the aid of horses. Many such lumber roads exist to-day, but few would now think of calling them railways. Yet these railways, as they were called, had been in use long before the first colony landed at Jamestown. After Watt invented the steam engine, however, many people thought it possible to construct an engine that would pull these wagons over the wooden roads. But it was the general belief that the rail and wheels of the engine must have cogs, in order that the wheels might "bite" the rails and thus get the necessary "pull." Hence, small strips of iron were laid on the wooden rails.

The Inventor of the Locomotive. It was George Stephenson, the son of a poor miner, who gave the locomotive to the world. It was his genius that revolutionized land traffic, changed old lines of transportation, and made it possible for the remote districts of America to connect easily and quickly with the markets of the world. It is fitting, therefore, to study this man and his wonderful invention that brought the East and the West so closely together and that made Indian corn the great national grain of America.

This great inventor was born in a small coal-mining village near Newcastle, England. His father, Robert Stephenson, was fireman of one of the pumping engines at the mines. George carried his father's dinner and helped his mother take care of his younger brothers and sisters. His highest ambition was to work with his father at the mines, and as soon as he was large enough he was employed as "picker," to clear the coal of stones and dross. Within a short time he had become a fireman like his father. At the age of seventeen he became a master engineer, and thus passed his father in his profession.

In 1804 he went to live at Killingsworth where he acquired his reputation as an engineer and where he invented the locomotive.

An engine known as the Blenkensop engine had already been operated. It communicated the power to cog wheels which acted on cog rails, independent of the four wheels that supported the engine. This



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Stephenson's locomotive, the model for all the locomotives that have been constructed, is still preserved at Canterbury, England

was in accordance with the old ideas concerning steam railways. Stephenson studied this engine, and experimented with it. He believed that the adhesion of the wheels to the rails would be sufficient to pull the train without the cogs. On July 25, 1814, he gave to the world his locomotive with smooth wheels rolling on smooth rails. It was a success

from the beginning. The experiment was no sooner made than the capacity of his engine was doubled, and by 1815 he had so improved his engine that it really became the model of all that have since been constructed.

This wonderful invention had been in use at Killingsworth many years before it excited any interest. Stephenson had no means of bringing it to the notice of the public, and it was not until 1821, when a horse-car road was proposed from Liverpool to Manchester, that Stephenson came prominently before the public. He was instrumental in having the plans changed from cog rails to smooth, and this road, completed in 1829, became the first important road in the world to operate the steam locomotive. When the road was completed the company offered a prize of five hundred pounds for the best locomotive.

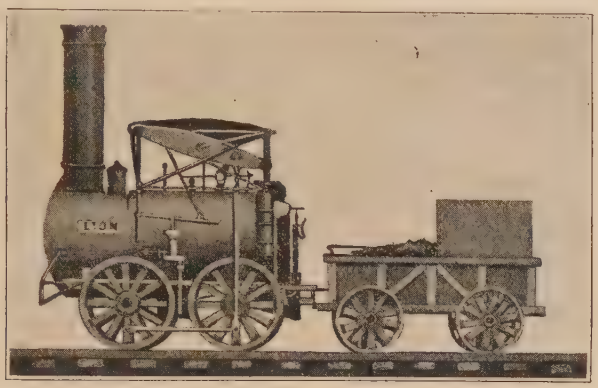
The "Rocket." Stephenson in the meantime had erected a locomotive factory. Other engineers also had begun the construction of locomotives, but it was Stephenson's "Rocket" that won. The public opening of this important railroad took place on September 15, 1830. The Duke of Wellington, Prime Minister, and Sir Robert Peel, Secretary of State, were present. Thousands of people turned out to see the trains run. Mr. Huskinson, a member of Parliament, in attempting to pass one of the doors, stumbled and fell on the track. The "Rocket" passed over him and he died that evening. One of the engines conveyed the body back to Liverpool

at the rate of thirty-six miles an hour. This incredible speed burst upon the world as a most startling phenomenon. The Duke of Wellington was so frightened that he would not ride on a train until years afterwards—not until the king and queen had made several trips.

The Value of Stephenson's Invention. The new road was a success from the beginning. The names of George Stephenson and his son, Robert, who was his father's greatest support, were on the tongue of every one. Their success was assured. The countries of Europe were calling for their assistance; America was calling for Stephenson's locomotive. Mountains were tunneled; seaports were connected with remote interiors; swamps and rivers were bridged; the "iron horse" was introduced into every civilized land. Bread became cheaper, since it could be carried quickly from country to country; while the corn of America could be easily distributed among the markets of the world. George Stephenson made every civilized land feel the force of a universal progress. The great railway systems of the world to-day, as they carry thousands of people from town to town, as they transport millions of tons of the world's necessities of life, pay tribute to the genius, skill, and energy of George Stephenson, the inventor of the locomotive.

The Coming of the Locomotive to America. The corn country had long been awaiting some mighty force like the locomotive. It was not expected, however, that it would ever compete with the canal

boat or the steamboat. It was thought that the railway would serve merely as a convenient mode of



The Stourbridge "Lion." This locomotive, built in England in 1829, was the first practical steam locomotive to run in America

connecting cities with waterways. At first locomotives were not expected to be freight carriers to any great extent, but it was believed that they would carry chiefly passengers and mail, and at most the lighter freight.

The opening of the Erie Canal, connecting New York with the corn country, roused Pennsylvania to action. The corn and wheat of the West were going to New York. In 1826, therefore, Pennsylvania began her system of public works, the main feature of which was a rail-and-water route between Philadelphia and the Ohio River. Nothing illustrates more forcibly the intense interest the East had in the corn of the West than this Pennsylvania undertaking. It consisted of a railway between

Philadelphia and the Susquehanna River, a canal up the Susquehanna and Juniata rivers to Hollidaysburg, a portage railway to carry the canal barges over the mountains from Hollidaysburg to Johnstown, and a canal connecting Johnstown with Pittsburgh. As soon as Pennsylvania began this system of internal improvements, Maryland also became very active and the Baltimore & Ohio Railway was begun. That all these lines were working toward the great corn country is easily seen. In 1828, Charles Carroll, the only surviving signer of the Declaration of Independence, broke ground for a steam railway from Baltimore to Ellicott's Mill, Maryland. The locomotive that drew the solitary wagon on this road was built by Peter Cooper, and it was the first American-built locomotive engine. On its trial trip it ran a race with a stage-coach, and there was great rejoicing when "Tom Thumb," the engine, won the race.

The efforts of the Eastern States to connect with the West roused South Carolina and Georgia to activity. They, too, began to look for a closer union with the Southwest. While New York, Pennsylvania, and Maryland were experimenting with the locomotive, South Carolina was engaged in building a railroad from Charleston to Hamburg on the Savannah River.

While Stephenson was experimenting with his engine in England wooden railways were being built in America. When the Baltimore & Ohio road was first opened in America, horse cars were used. But

the carriages moved so easily on these smooth rails that two dogs harnessed to one carriage containing six persons trotted away with much ease. Another carriage fitted out with sails moved along the road, to the amusement of the spectators. Every road was making experiments, and many kinds of motive power were tried. However, the success of the Liverpool-Manchester Road of England, in 1830, when Stephenson's "Rocket" made its successful trip, impressed the world with the fact that a revolution in transportation was at hand. In the same year the second American-built locomotive, "The Best Friend," was put to work on the South Carolina road. The following year the Baltimore & Ohio Company offered a prize of four thousand dollars for an American engine. The prize was won by the "York," built by Messrs. Davis and Gartner of York, Pennsylvania. In 1832 Matthias W. Baldwin built his engine, "Old Ironsides," modeled after Stephenson's engine. This was the beginning of the American locomotive.

The Railroad starts toward the Corn Country. After the appearance of the locomotive the one dream of the eastern markets was to extend the railroad into the corn country. Maryland, Pennsylvania, and New York were competing for the corn of the West, and other leading lines were started westward.

The great panic of 1837 checked canal building; in fact, the railway was beginning to prove a serious competitor of the canals for the trade of the West.

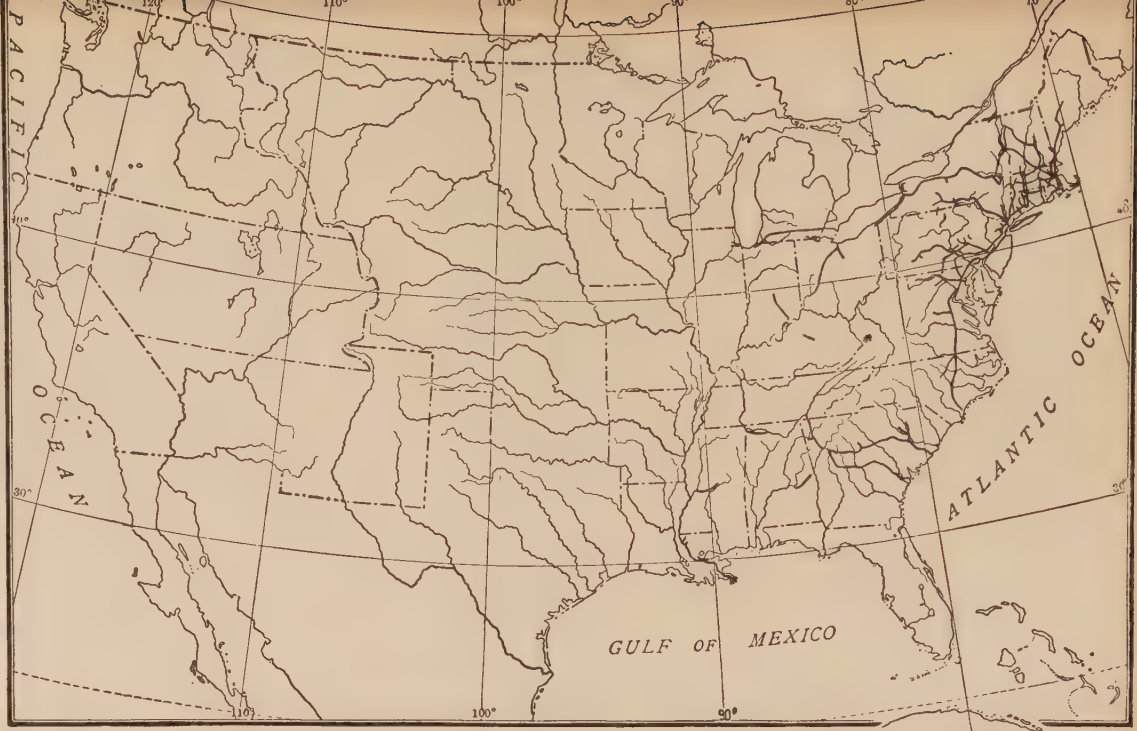
As the country recovered from the financial disturbances the renewed activity in internal improvements was spent in building railroads, and the importance of the canal began to decline.

The locomotive in the meantime was slowly creeping toward the West. The railways were like strong iron arms held out by the cities of the East to the cornfields of the West. By 1842 Albany was connected with Buffalo. Nine years later (1851)

Photograph by E. J. Hall

Corn and alfalfa in the Fox River Valley, Illinois, the heart of the vast corn country that for more than half a century has been the granary of the world

the New York Road had reached Dunkirk on Lake Erie. When the first wagon train was started between Philadelphia and Pittsburgh, Baltimore saw the tremendous value of the trade with the grain country, and almost as soon as the Stephenson engine was given to the world Maryland, and Baltimore especially, became very active. In 1853 the Baltimore & Ohio Railway connected Baltimore with the Ohio River. The very heart of the corn country was at last reached. It is interesting to



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Map showing the distribution of railroads in the United States in 1850

note here that the railroads in crossing the mountains always followed the old Indian trails.[1]

The Effect of the Railway. George Stephenson's wonderful invention was the beginning of a new chapter in the world's history and a mighty era in the world's progress. By it the great distance between the East and the West was overcome, and the Appalachian Mountains no longer stood as a barrier between the grain fields of America and the markets of the world. The railroad drew the trade from the Mississippi River and broke the union of the West and the South. To-day the great highways of commerce run east and west. As the railroad pushed into the far Northwest a new industrial center developed, and the pork-packing business was moved from Cincinnati to Chicago. New Orleans ceased to be the leading distributing point of the Mississippi Valley, and Chicago, the result of the union of the railroad and the grain fields of the West, has become one of the greatest cities in the world.

Before the railroad entered the West, corn formed only a small part of the foreign trade of America. It had been difficult to ship corn to any great distance because it molded so rapidly when stored in large quantities. This grain, so important to the early settlers and so valuable as a food for cattle, hogs, and

[1] The following table shows the number of miles of railroad built in each decade from 1820 to 1900:

Year	Miles	Year	Miles
1830	23	1870	52,922
1840	2,818	1880	93,296
1850	9,021	1890	166,703
1860	30,626	1900	194,262

horses, was necessarily consumed on the farm, and a surplus crop was practically a waste. Our early reports on trade and commerce had little to say of this grain that has become so important to the welfare of the nation to-day. Before the railroad entered the West the chief value of corn was in supplying a primary and very necessary food for man until the land would produce wheat. Then it became of secondary importance as a food for man,

Photograph by Wm. Baylis

A modern freight carrier. Through the development of the locomotive corn became the national grain of America and an important part of our foreign trade

although still of primary importance as a food for stock. We have already seen how the trade in live stock added materially to the wealth of the West.

After the coming of the railroad, however, large quantities of corn could be moved quickly, and hogs and cattle could be shipped with but little loss of weight. Such great quantities of corn and meat were shipped from the West that the East almost ceased to grow its foodstuffs and relied chiefly upon

the western farmer for food. The corn of the Indians now became the great national grain of America, and for a time contributed more to the wealth of this country than did all the cotton of the South, and all other cereals combined. For more than half a century the West has been the granary of the world. From the time that John Smith's Virginia colony was saved from starvation by this grain, until the coming of the railroad, it formed the chief food of all settlers as they opened up new lands and "extended" the western boundaries of the nation. After the coming of the railroad, Indian corn entered into the commerce of the world and became the most important cereal of America.

CHAPTER XIII

The Granary of the World

A New Era. Many changes have taken place in the world's history, and especially in the development of the United States, since the railroads of the East entered the great corn country. So great have been the changes that hardly a man lives to-day as did our grandfathers in the days of the old stage-coach, when our grandmothers cooked in the open fireplace, covered up the live coals at night for fear of losing the fire, and read or sewed by the light of the tallow candle. Cook stoves had not yet come into common use; the friction match was rarely seen; the kerosene lamp, to say nothing of electric lights, was entirely unknown. Manners, customs, and habits of living have all changed since then. But the changes in our political and industrial life have been equally great.

Before the railroad entered the West the destiny of the corn country was linked with that of the cotton country of the South. In those days commerce followed the rivers, and the mighty Mississippi was the greatest highway of trade in America. But when the railroads from New York, Philadelphia, and Baltimore pushed across the mountains into the Ohio Valley the interests of the corn country were turned away from the South. Henceforth all

great questions concerning the welfare of the nation were decided by the East and the West, while the South was left to itself. Slavery, the tariff, internal improvements, and the distribution of the free public lands were very important questions when the locomotive made its first trip across the mountains. As long as the interests of the corn country and the cotton country were the same commercially the two sections of the Mississippi Valley remained united politically. But when the corn country became united commercially with the business centers of the East, the South, with its institution of slavery, was too much isolated to remain a factor in the further development of the nation. The cotton states withdrew from the Union, and Civil War followed.

The Movement Westward. Although this war broke the South, it interfered but little with the marvelous growth of the corn country. The table in Chapter XI shows the westward movement of population to 1850. We have followed migration across Ohio, Indiana, and Illinois. We have seen this great tide of homeseekers cross over the Mississippi into the rich river valley of the Missouri and into the prairie lands of Iowa. We then saw this tide turn northward into Minnesota. We have seen great numbers of Irish and Germans flee from the famines and wars of the Old World and join the immigrant trains leading into the far Northwest. The object was always the same—possession of the rich corn-producing land—and not even the Civil

War could break the charm of the waving corn fields for the distressed of the East and the multitudes that came to our shores.

The coming of the railroad so facilitated travel westward that the stream of settlers bound for the rich lands of the great West increased in volume even during the years from 1860 to 1870, while the great Civil War was in progress. Notice the following table:

POPULATION IN THE CORN COUNTRY FROM 1850 TO 1870

STATE	1850	1860	1870
Ohio	1,980,329	2,339,511	2,665,260
Indiana	988,416	1,350,428	1,680,637
Illinois	851,470	1,711,951	2,539,891
Michigan	397,654	749,113	1,184,059
Wisconsin	315,391	775,881	1,054,670
Iowa	192,214	674,913	1,194,020
Minnesota	6,077	172,023	439,706
Kansas	.....	107,206	364,399
Nebraska	.....	28,841	122,993

Minnesota, in 1850, had only about six thousand inhabitants, but in 1860 the number had increased to more than one hundred seventy thousand, and ten years later it was not far from half a million. Kansas, in 1860, had only about one hundred thousand settlers, but ten years later it had more than three hundred fifty thousand. Nebraska, in 1860, had less than thirty thousand people, but ten years later the number had increased to nearly one hundred twenty-five thousand. Up the Missouri and the Platte went the homeseekers of the world, until the western limits of the prairie lands were reached, and the great grassy plains of the land

of little rain presented a new soil and a new climate.

The Limits of the Corn Country. West of Kansas and Nebraska are the plains of little rain. This is the land of cowboys and cattle ranches. When the first settlers reached these big, grassy plains many of them turned northward, always following the rich river valleys and fertile lands that promised an abundance of grain. On into the Dakotas they went, until they reached the Canada line.

THE CENTER OF POPULATION FROM 1790 TO 1910

DATE	APPROXIMATE LOCATION	WESTWARD MOVEMENT IN MILES
1790..	23 miles east of Baltimore, Md.	..
1800..	18 miles west of Baltimore, Md.	41
1810..	40 miles northwest by west of Washington, D.C.	36
1820..	16 miles north of Woodstock, Va.	50
1830..	19 miles west-southwest of Moorefield, W.Va.	39
1840..	16 miles south of Clarksburg, W.Va.	55
1850..	23 miles southeast of Parkersburg, W.Va.	55
1860..	20 miles south of Chillicothe, Ohio	81
1870..	48 miles east by north of Cincinnati, Ohio.	42
1880..	8 miles west by south of Cincinnati, Ohio.	57
1890..	20 miles east of Columbus, Ind.	48
1900..	6 miles southeast of Columbus, Ind	14
1910..	In the city of Bloomington, Ind.	39

Notice in the table above how the center of population has moved westward since the beginning of the westward migration.

The last large section of the prairie to be opened to settlers was Oklahoma Territory. This was originally a part of the old Indian Territory, set apart for the use of the Indians who had been driven from the lands east of the Mississippi. There was a strong demand for this land, as it was very fertile and easily cultivated. The national govern-

ment announced that on April 22, 1889, the Territory of Oklahoma would be thrown open to settlers.

Herding cattle in Montana. Beyond the western limit of the corn country the settlers turned to stock raising, and great herds were pastured on the dry grassy plains and then driven to the corn states to be fattened for market

No one was allowed to enter until noon of the day advertised. As the day approached, thousands of homeseekers, many with their wives and children, crowded along the boundary line and waited eagerly for the signal to enter. On the day set, exactly at the noon hour, the signal was given; and before sundown fifty thousand settlers had entered the new territory and staked their claims. Guthrie, the first capital, was built in a day, with ten thousand inhabitants. That was probably the most remarkable rush for new land by enlightened people that the world has ever seen. But Oklahoma is the last of the great prairie states, and all the land of

the corn country is now taken up; indeed, some of the states that received such large numbers of settlers only a few decades ago have even ceased to grow, as the table given below shows. Notice especially the state of Iowa. Other states have lost in population in the farming districts, though the cities have grown considerably.

POPULATION IN THE CORN COUNTRY FROM 1880 TO 1910

STATE	1880	1890	1900	1910
Ohio	3,198,062	3,672,329	4,157,545	4,767,121
Indiana	1,978,301	2,192,404	2,516,462	2,700,876
Illinois	3,077,871	3,826,351	4,821,550	5,638,591
Michigan	1,636,937	2,093,890	2,420,982	2,810,173
Wisconsin	1,315,497	1,693,330	2,069,042	2,333,860
Minnesota	780,773	1,310,283	1,751,394	2,075,708
Iowa	1,624,615	1,912,297	2,231,853	2,224,771
Nebraska	452,402	1,062,656	1,066,300	1,192,214
Kansas	996,096	1,428,108	1,470,495	1,690,949
North Dakota	.....	190,983	319,146	577,056
South Dakota	.....	348,600	401,570	583,888
Oklahoma	.....	258,657	790,391	1,657,155
Tennessee	1,542,359	1,767,518	2,020,616	2,184,789
Kentucky	1,648,690	1,858,635	2,147,174	2,289,905

Prosperity of the Corn Country. When the census was taken in 1910 over thirty million people were living in the upper Mississippi Valley. This wonderfully fertile region produced such tremendous quantities of foodstuff that great commercial centers were needed to distribute the grain and its products to the Eastern States and to the countries of Europe. Large cities sprang up as if by magic. The wheat, corn, hogs, and cattle, and the natural products of the forests and the mines, had to be prepared for the markets of the world. Therefore such industries as flour mills, packing houses, grain elevators, and a

PACIFIC OCEAN
ATLANTIC OCEAN
GULF OF MEXICO
Under 2 per square mile
2 to 6 per square mile
6 to 45 per square mile
45 to 90 per square mile
90 per sq mile and over
Center of population

The distribution of population in the United States at the beginning of the twentieth century

variety of manufacturing industries soon increased the wealth of the country, and continued to draw settlers from every section of the civilized world. In fact, these manufacturing centers have drawn so heavily from the rural districts that the population engaged in agricultural pursuits has decreased in some of the states.

As the railroad moved farther and farther westward it had the tendency to carry the prices of the East and of Europe to the fields of the West. Compare the prices at Cincinnati in 1826 and in 1860:

Product	Price in 1826	Price in 1860
Flour	$3.00 a barrel	$5.60 a barrel
Corn	.12 a bushel	.48 a bushel
Hogs	2.00 a cwt.	6.20 a cwt.
Lard	.05 a pound	.11 a pound

The railroad not only made it profitable to raise wheat, corn, hogs, and cattle, but as these articles

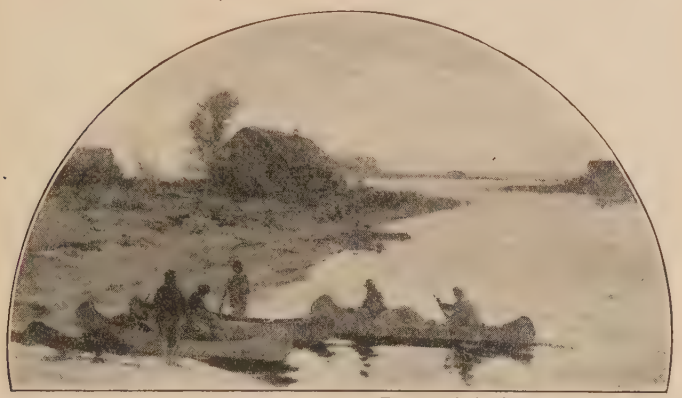
rose in value the land also increased in value. Public lands in Illinois that the government had not been able to dispose of for one dollar and a quarter an acre became at once very valuable, and in 1860 the same lands were selling for eleven dollars and fifteen dollars an acre.

The railroad, however, was not the only agency that carried prosperity to the Northwest. The steamboats on the Mississippi and the inland canals contributed their part likewise. But the Great Lakes had the greatest influence of all the water routes on the building of the West. The steamboat appeared on the lakes before the railroad had penetrated the heart of the West, and the lake route has always been the cheaper route. For over half a century there has been strong competition between the railroad and the steamboat for the trade of the West, and this has lowered transportation rates more and more.

In 1820, before the days of the canal or railroad, it cost two dollars to send a bushel of wheat or corn from Buffalo to New York. In 1840, however, when the Erie Canal was the great carrier, it cost about seventeen cents a bushel. It is easy, therefore, to see the advantage of the canal. In 1900, after the railroad had entered into competition with the canal boats, the rate per bushel between Buffalo and New York had fallen to less than two cents. At that time a bushel of wheat or corn could be moved from Chicago to New York for less than five cents. It is easy to see, therefore, how the West would profit greatly by this competition.

The prosperity of the corn country finds its most characteristic expression, however, especially in the growth of one city that is distinctly the product of the corn of the Northwest.

How Grain made Chicago. Study a map of the Northwest and notice particularly the location of Chicago. In 1812 the site upon which this



From a painting by Laurence C. Earle

Chicago River near Wolf Point, 1833. Chicago then consisted of a few rude houses on the banks of the river, in a marshy region known to the Indians as "Wild Onion Place"

mighty city stands to-day was a marsh containing only the ruins of an abandoned fort. The Indians spoke of it as "Wild Onion Place." Not until 1833 did it become even a town. What is now the chief business section of Chicago was then a pasture, and all the mail received into the little village was deposited in a drygoods box which served as a post office. With the appearance of the steamboat on the lakes a profitable trade developed, and in 1840

Chicago had a population of 4,479. It is said that hogs were so numerous in and around the town at that time that they wandered at will through the streets and at last became such a nuisance to the inhabitants that in 1843 an act was passed depriving them of the freedom of the city.

The cornfields were steadily drawing the population westward into Michigan, Wisconsin, and Minnesota.

Photograph by Frank M. Hallenbeck, Chicago

A busy corner, Chicago. In 1833 this section was a pasture and as late as 1843 hogs wandered at will through the streets of the village

The Illinois & Michigan Canal, connecting Chicago with the Mississippi River, was completed in 1848 and the cornfields of the upper Mississippi Valley were connected with the lake ports. Four years later

the railroad entered the city. This was the beginning of Chicago's wonderful development, and commanding as it does the greater part of the trade of the upper Mississippi Valley, it soon became the greatest food market in the world. At that time, 1852, the population was hardly thirty thousand, but in 1870 it had increased to over three hundred thousand.

Consult your geography again and you will observe that Chicago's location gives it a considerable advantage over Cincinnati. The new corn lands opened up after 1840 found a market at Chicago. Vast areas were opened, railroads were built, and the grain and pork of the upper Mississippi Valley poured into Chicago. By 1860 the trade of the grain country was turning away from the Mississippi Valley toward the lakes, and New Orleans had ceased to control even a large part of the grain of this valley. By 1870 Chicago had become the food center of the world.

CHICAGO'S REPORTS IN WHEAT AND CORN

YEAR	WHEAT AND FLOUR IN BUSHELS	CORN IN BUSHELS
1840....	10,000	.....
1845....	1,024,620	67,315
1848....	2,386,000	550,460
1853....	1,680,998	2,780,253
1856....	9,419,365	11,129,668
1861....	23,885,553	24,372,725

Corn did not enter the world's commerce to any great extent until after the rise of Chicago. The table above shows the wonderful rapidity with which corn rose to a place of importance in the world's markets.

Relation of Corn to the Live-Stock Industry. When John McKenzie of Ohio sent his first drove of cattle on foot across the mountains to Baltimore he started a business that has grown in importance until to-day the trade in meats is second only to that in breadstuffs. Great cornfields make it possible to produce large quantities of live stock, and when the corn of the West was rotting in the fields for lack of transportation, hogs were so plentiful that they became a nuisance in the streets of Chicago. The world needed the beef and pork of the West, but there was no quick way to get them to the markets. It could not be foreseen at that time that within less than half a century Chicago would become the greatest meat center in the world, that the pork-packing industry would move from Cincinnati to Chicago and become the leading industry of that city, and that Europe would buy millions of pounds of meat annually from Chicago packers.

In the fifties there were a half dozen stock yards located in various sections of Chicago, but at that time Cincinnati was still the center of the meat-packing industry. There was little demand then for the cattle and hogs received at the Chicago yards, and the stock was pastured in the surrounding prairie until there was a call for it. In 1865 all the stock yards were consolidated, and the hogs and cattle that once roamed around in that "Onion Town" and tormented the community now became part of a mighty business. To-day meat packing is the greatest industry of Chicago. From two

thirds to four fifths of the cattle and hogs received in the Chicago yards are killed and sent out in

A view of the cattle pens at the Chicago stock yards, where two million cattle and eight million hogs are gathered annually for slaughter

various forms of prepared meats and by-products (lard, fertilizer, glue, butterine, soap, and candles). The number of hogs packed yearly is about eight million, and of cattle, about two million. We can appreciate these figures when we learn that Chicago slaughters more hogs annually than are raised in all the Atlantic States from Maine to Florida, omitting New York, New Jersey, and Pennsylvania. Thus, in addition to the amount of grain shipped to the East, and to European markets, the corn of the West is converted into cattle and hogs, and corn

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Map showing the areas in which hogs were raised in 1909

products in the United States to-day have a valuation greater than that of all other agricultural products combined.

As population moved westward into the great plains, the grass-fed cattle of Montana, the Dakotas, and even Texas were shipped to Chicago, where they were prepared for the markets of the world. Every farmer in the corn belt contributed his quota of hogs and cattle, thus giving a meat supply to the whole of America and to much of Europe. As the West developed, however, other centers like Duluth, St. Louis, Kansas City, and Omaha developed, and when the railroad entered these cities they, too, began to supply the world with foodstuff.

The Product of the Packing Houses. The packing houses have become great factories where complicated machinery is at work slaughtering the

animals and converting them into a variety of useful things. Nothing is thrown away. When settlers first entered the corn country very little of the cattle—save the beef, the hides, and the tallow—was used. But to-day not a thing from nose to tail is thrown away. The hide is first removed, and after being tanned is sent to the factories which make all kinds of leather goods. The hind quarters, loins, and ribs are carved into many kinds of steaks or roasts, and packed in ice for shipment. The fore quarters, after the bones are removed, are put into sweet pickle for several days, then boiled, packed into cans, and sold as corned beef. The bones are carefully preserved and made into such articles as combs, buttons, and hairpins,

Photograph by E. J. Hall

Some American corn-fed stock

or they are ground up and made into fertilizer. The hair is sold to plasterers; the hoofs are made into glue; and the blood is either sold to sugar manufacturers to be used in whitening sugar, or is sold for fertilizer. In addition to all this, we have beef extracts, various kinds of oil, tallow candles, tripe, pickled tongue, and many other products.

The number of articles made from the hog is likewise great. Nothing here is wasted. The hair is first removed and sold to dealers to be used in upholstering, plastering, and in the manufacture of ropes, mats, brushes, and so on. The meat is cut into hams of various shapes and sizes, and many kinds of side meat.

From the fat of the hog several grades of lard are made, to be used in cooking, in making a kind of butter known as butterine, and in purifying old butter. Sausage is made chiefly from the lean meat taken from various parts of the animal and much of it is stuffed into casings made from the entrails. Other parts of the flesh are converted into soap, glycerine, and so on, while the bones, blood, and all refuse taken from the stomachs of the animals are used in the same way as the similar parts of cattle.

The meat-packing business of Chicago is thus seen to be a great and far-reaching industry. Every grocery store in this country and in nearly every country of Europe carries many articles made from the cattle and hogs slaughtered in Chicago. As this business has grown there has come a greater

demand for the corn of the West, since the vast numbers of cattle and hogs depend in a large measure upon this for their food supply.

The Grain Trade of Chicago. Chicago's situation at the head of the most southwestern of the Great Lakes has given it great advantage in trade and industry. It has become the greatest railroad

From a painting by Laurence C. Earle

The first grain elevator in Chicago, 1838. The first shipment of grain, made that year, amounted to seventy-eight bushels. In 1910 Chicago shipped 225,000,000 bushels of corn alone

center in the world, and its ability to command a vast supply as well as its facility for distributing grain is unequaled by any city in the world. Therefore it is to-day the greatest grain market, the greatest live-stock market, and the greatest meat-packing center in the world. It receives annually nearly three hundred million bushels of grain and ships approximately two hundred twenty-five million bushels. The Chicago dealers received in 1910

more corn than is produced in all the Atlantic States from Maine to Florida, and much of the two hundred twenty-five million bushels shipped from that grain center was sold to the merchants of those states. When we remember that in 1838 Chicago made its first shipment of grain, and that the total amount was only seventy-eight bushels, we can have some idea of the tremendous development of this city which to-day is the second in size in America and the fourth in the world—and its wonderful growth has been due for the most part to the boundless cornfields of the West. So important has this grain market become that almost every hour in the day the telegraph or the telephone sends, to every part of the world, news from the Chicago grain market. London, Paris, Rome, Bombay, Sydney, Shanghai—every large commercial center of the world—looks each morning for the latest news from Chicago, to learn the price of bread and the world's supply of food.

The Center of the World's Food Supply. By 1870 the states along the coast had ceased to produce their own food supply. New England was producing less wheat in 1870 than in 1850, and by 1890 wheat cultivation had practically ceased in that section of the country. Food had been plentiful in the South Atlantic States until the Civil War, and even during that period it was produced in sufficient quantities to support the home folks and supply the army in the field. By 1870, however, the food supply had been reduced about one half, and in 1890 very few

of the Southern States were producing as much food as in 1860. In the meantime, however, the population of these states had almost doubled. In the Middle Atlantic States the food supply was barely holding its own. The following table tells the story:

PRODUCTION OF WHEAT AND CORN ON THE SEABOARD

WHEAT

STATES	1850	1890	LOSS OR GAIN
New England.....	1,100,000 bu.	290,000 bu.	73% loss
Middle Atlantic....	35,067,000	41,582,000	19% gain
South Atlantic.....	15,575,000	14,000,000	10% loss

CORN

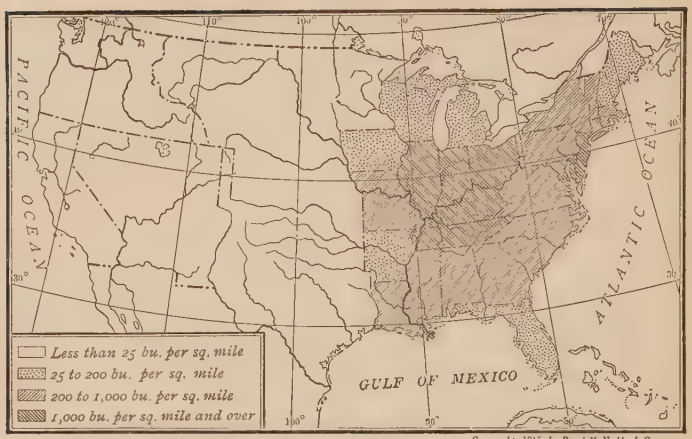
STATES	1850	1890	LOSS OR GAIN
New England.....	10,200,000 bu.	6,126,000 bu.	40% loss
Middle Atlantic....	60,348,000	84,090,000	39% gain
South Atlantic.....	111,608,000	99,700,000	11% loss

POPULATION

STATES	1850	1890	GAIN
New England.....	2,728,116	4,700,745	73%
Middle Atlantic....	6,573,301	13,917,683	111%
South Atlantic.....	3,952,837	6,653,851	69%

The population of the seaboard states was more than doubled in the period from 1850 to 1890, while the production of food was reduced about one half. Therefore, if the seaboard states had not received grain from the West their inhabitants might have starved. The total food supply of America, however, was rapidly increasing. The grain fields of the great West were supplying the whole of America and a large part of Europe with food, and annually drawing millions of inhabitants from the Old World.

Between 1850 and 1890 nearly fifteen million


PACIFIC OCEAN
ATLANTIC OCEAN
GULF OF MEXICO
Less than 25 bu. per sq. mile
25 to 200 bu. per sq. mile
200 to 1,000 bu. per sq. mile
1,000 bu. per sq. mile and over
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Map showing the production of corn in the United States in 1849

immigrants came to America. The following table shows how immigration increased by decades from 1823 to 1910:

Year	Immigrants	Year	Immigrants
1823....	6,334	1870....	387,203
1830....	23,322	1880....	457,257
1840....	84,066	1890....	455,302
1850....	369,986	1900....	448,572
1860....	150,237	1910....	1,041,570

The free lands and the great fields of grain had made the West so prosperous that a steady stream of settlers from Europe poured into this country. They filled up the cities, supplied laborers for the growing industries, and bought homes in the fertile lands of the West. And it was in the decade from 1890 to 1900 that corn products, including all kinds of meats from animals fattened on corn, surpassed in value all the other agricultural products combined.

CHAPTER XIV

How the West became the Granary of the World

Before the Days of Improved Machinery. When we consider the crude tools that our ancestors in Europe used to cultivate the land we little wonder that the world was frequently visited by famine. Plowing with a crooked stick and reaping with a hand sickle are certainly very inadequate means for providing the world with food. Improved machinery for cultivating the land was late in coming. The great manufactories of the East were drawing laborers from the fields, and this would have diminished the food supply very materially but for the opening up of the fertile lands of the Mississippi Valley, which drew several million people from the East and from many sections of Europe.

Wheat could not be depended upon. It required nine months to grow a crop, and when it was ripe for harvesting it must all be gathered at once or the rains and storms of summer would destroy much of it. It had to be cut by hand. The sickle was first used and then came the hand scythe, but this was a slow process and many hands were required to gather the crop. The corn of the country had also to be gathered by hand, but Indian corn would thrive in any climate and soil in America. Before

the days of improved machinery a man could cultivate a few acres simply by using a crooked piece of iron as a hoe, and have food in plenty. The great prairies of the West could produce both wheat and corn in tremendous quantities, but the problem was how to harvest each with the least expense. The cost of getting the grain from the fields, in those days of slow transportation, was frequently equal to the market price. Settlers in the great grain country usually cultivated only small areas, but even then when laborers were scarce much grain was often left in the fields for the cattle and hogs to eat.

The great changes that have taken place since those early days when tools were few and very crude would furnish material for one of the most interesting chapters in the history of America. The genius of man gave the steamboat and the railroad. These brought the West in touch with the great commercial centers of the world. Not only that, but these agencies created in the West itself some of the leading world centers. Other inventions came along with the railroad and the steamboat and coöperated with them in making the West the granary of the world. The first of these was the reaper, used in harvesting the wheat. It is one of the most important inventions in the whole history of America, and it led the way for the invention of many other machines now used in harvesting corn.

McCormick and the Reaper. Before the Revolutionary War a family of McCormicks had settled in a valley of Virginia, and in 1809 Cyrus Hall

McCormick of the third generation was born. He received the greater part of his training in his father's workshop, where farming utensils were made for the McCormick plantation. Much of his time, however, was spent in the fields with his father. Here he discovered that reaping wheat with a sickle or hand scythe was no quick or easy task, and that swinging a wheat cradle all day under the summer sun was about the hardest work that had to be done on the farm. Cyrus's father had invented a heavy, awkward machine, called a reaper. This was pushed by a pair of horses, and was not successful.

Cyrus began where his father left off, and by 1831 he was ready to try his machine. It was not until 1834, however, that he took out his patent.

For a few years McCormick lost money on his machines. The great wheat country was west of the mountains, and it was difficult in those days of slow transportation to ship his reapers to the West. In 1847 he decided to locate in Chicago, which at that time was becoming an important lake port. He needed money to put his machines on the market, and was fortunate in being able to form a copartnership with William B. Ogden, who paid him twenty-five thousand dollars for a half interest in the invention. The business grew so rapidly that at the end of two years McCormick was able to buy back the half interest for fifty thousand dollars.

The Effect of the Reaper. The reaper was a necessity because farm laborers were scarce and the wheat fields enormously productive. In fact, the

growth of the newly opened West would have been indefinitely retarded if man had had to cut the grain by hand and harvest it in the old primitive way which was little better than the method used by the Egyptians in the days of Joseph and the Pharaohs. The reaper was now a success, and soon made its appearance in the fields of Russia, Siberia, Germany, France, India, Australia, the Argentine country, and wherever wheat was cultivated. It more than trebled the output of grain, and made it possible for cheaper bread to reach the people of every civilized land. Because of this it is an invention of the greatest economic value to the world.

The Threshing Machine. In the earliest times the grain was probably shelled by hand, but as the quantity increased it was beaten out with a stick and separated from the chaff by throwing it up in the air. The Egyptians and Hebrews had the custom of spreading the loosened sheaves on the ground and driving oxen, sheep, and other animals round and round over them so as to tread out the grain. But the ancient nations observed that this process damaged the grain, so crude machines with rollers and spikes were invented. The first really successful machine was invented by a Scotchman in 1786, and it became the model for all subsequent threshers. With the development of the steam engine the threshing machine increased in usefulness and efficiency, and after the reaper became highly perfected, the thresher and reaper were combined in one large machine, drawn at first by twenty horses and

later by a traction engine. The two machines, now combined into one, can cut, thresh, and sack many hundred bushels a day.

The Necessity for Machines to Harvest Corn. Even before the railroad entered Chicago, Indian corn was the chief crop of the northern Mississippi Valley, and long before the reaper was invented attempts had been made to construct a machine that would make the harvesting of corn much easier. The success of the McCormick reaper in harvesting wheat, oats, and other similar cereals caused many mechanics to turn their attention to working out an invention for harvesting corn. The amount of work that one man can do without the aid of machinery is limited. Hence, the extent of the cornfields would be limited by the number of hands that could be employed to cultivate and harvest the grain. The amount of grain, together with the number of hogs, cattle, and horses, are all dependent to-day upon man's ability to make the land yield its best. With the aid of machinery, man's hands are multiplied almost indefinitely.

The reaper came to aid man in harvesting wheat, oats, rye, and other such cereals, and made the increased production of these cereals marvelous. Man's working capacity had been increased a hundred fold. But Indian corn, the great American grain, that had saved the first colonists on the Atlantic coast, supported Daniel Boone and the first settlers of the prairie country, and made Chicago the great food market of the world, was, until a few

years ago, harvested almost exclusively by hand. No machine which could relieve the farmer of the drudgery relative to the gathering of this most valuable grain had been perfected. In order to appreciate more fully the necessity for such an invention, let us pause to study the methods of harvesting corn.

Methods of Harvesting Corn. In most sections of the country where corn is one of the leading forage crops, it is customary to cut the stalks close to the ground. This is done at a time when no damage is effected to the ripening grain and while a considerable amount of the saccharine juices still remain in the stalk. The corn is then set up in shocks to cure. These shocks, varying greatly in size, range from six hills square (thirty-six hills to the shock) to sixteen hills square (two hundred fifty-six hills to the shock). The size depends usually on the variety of corn, some kinds requiring a longer time to cure than others.

One common method of shocking is to tie the tops of four hills together as they stand and then cut and shock the rest around them. Another method is to use a frame called a "wooden horse," or a post fixed in the ground, as a kind of support. In either case, great care is taken to build the shock closely around the support that it may not be blown down by heavy winds or damaged by rain.

After the fodder has been cured, which generally takes about a month, the corn is usually husked by hand in the field. The "stover"—what is left after

Photograph by E. J. Hall

Corn fodder in the shock

the ears have been removed—is then tied in bundles and reshocked, and the ears thrown into a pile on the ground near the shock to be hauled to the barn and stored. Sometimes the stover is hauled to the barn, but it is usually left standing in shocks until needed for fodder.

In some sections of the Central and Southern States, where the soil is rich and the growing season long, the corn grows so tall and large that the stalk

does not make a good forage crop. The farmers of the South strip the blades by hand from these standing stalks. This is called "pulling fodder." The blades thus stripped and well stored furnish an excellent but expensive forage, for different experiment stations in the South have proved conclusively that the stripping of corn blades is unprofitable. In other sections of the country the stalk is cut

Photograph by E. J. Hall

A corn harvester in operation

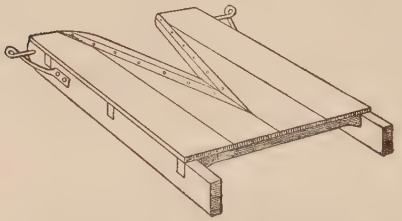
just above the ear. By this method the part of the stalk which is most readily eaten by stock is obtained with the least waste. Experiments have shown, however, that it is more profitable to cut and shock the whole plant. In the Middle West the term "fodder" means the entire plants as ordinarily cut and shocked, while in many parts of the South this term is applied only to the blades stripped from the stalk.

These methods are still used throughout the country. It is estimated that one man can cut and shock by hand about one and one half acres a day. Although the cost per acre is not very high, still the amount that can be produced is limited by the capacity of the men employed. Machines to improve the producing capacity of one man are needed, and such machines are already in evidence.

The First Machines for Harvesting Corn. As early as 1820 attempts were made to construct a machine that would make it easier to harvest corn. From that time until 1892 all attempts to perfect such a machine on a large scale were unsuccessful. The implement first used for cutting corn was the hoe, but, as this was rather heavy and awkward, the more progressive farmers substituted corn knives. These were usually made from scythe blades, but they have now given way to all sizes and shapes of factory-made knives.

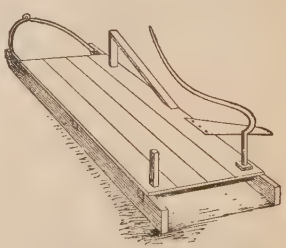
Many homemade harvesters of the sled pattern were made from time to time, the first of these being patented by J. C. Peterson, of West Mansfield, Ohio, who put one in the field in 1886. The illustrations given on the next page show the different models in use. Usually the driver rode on the platform, gathering the stalks in his arms to prevent them from falling in all directions. As this was very laborious, an arm was added to the machine, as shown in the second illustration. This collected the stalks on the platform, and the driver needed only to pick them from the sled and throw them to the ground.

The next improvement was to mount the sled on wheels, as shown in the illustration on the opposite page. This machine cuts two rows at a time. Two men sit on the platform, one facing each row, and they guide the corn against the cutting edge with one hand while with the other they hold the stalks until enough have been collected to form a shock. This is the most satisfactory as well as the least expensive of all the corn-harvesting machines. When a large acreage is to be gone over during the limited time within which it is most profitable to cut corn, corn binders and corn shockers are the most economical machinery.



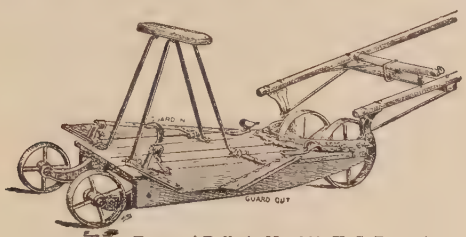
From Farmers' Bulletin No. 303, U. S. Dept. Agr.
A homemade one-row harvester, sled pattern

Corn Binders. One of the earliest forms of corn harvester and binder was constructed as a modified form of the McCormick reaper. A machine embodying principles which seem destined to prevail in corn harvesting was invented by A. S. Peck of Geneva, Illinois, and patented January 5, 1892. It consisted of a corn harvester with two divides passing one on each side of a row of corn. These cut the stalks and carried them back in a



From Farmers' Bulletin No. 303, U. S. Dept. Agr.
Improved one-row harvester, with arm added

vertical position to the binder attachment. A standard twine binder was used, set in a vertical position so as to receive the stalks and keep them in position until the bundle was tied. The horses were hitched behind the machine. Since 1895 the self-binding corn harvester has had a considerable sale, especially in the leading corn states. The main features of the Peck type predominate in practically all the corn binders now built.



From Farmers' Bulletin No. 303, U. S. Dept. Agr.

The two-row harvester on wheels. Two men sit on the platform to aid in cutting and gathering the stalks

Corn Shockers. The present corn shocker was invented in 1888 by A. N. Hadley. It is built with a frame mounted on two wheels, and consists of a device, the same as in the corn binder, for gathering the corn. It has a device that cuts the corn as the machine advances. Behind the cutting device the corn is collected, shocked, and lifted to the ground by means of a crane. Improvements have been made in this machine with the result that the whole operation of forming, tying, and setting a shock can now be done in five minutes. The work of only one man is required, and its cost is

about the same as that of a binder, which requires the driver and two or three men to follow and shock the corn. The shocker requires one man and three horses to operate the machine, which can cut and shock nearly five acres a day. Another machine known as the "loader" has also been invented. As this can easily handle two shocks a minute, and can lift two thousand pounds, it adds greatly to the value of the shocker.

Corn Pickers. In the "corn belt" corn is raised principally for the ears, which are "husked" or picked by hand. For over fifty years inventors have been busy trying to perfect a machine to pick the corn from the stalk. Such a machine was invented in 1850, and another type in 1874. These, however, have not been successful. Thus far no picker has been constructed that will not to some extent break down or tear the stalk and shell the corn.

Between 1880 and 1890 a great deal of attention was given to threshing corn. This led to the invention of a combined husker and shredder, which takes the stalks with the ears on them, removes and husks the ears, and then prepares the stalks for feeding.

The Plow. The most important of all agricultural operations is the breaking of the soil. When the prairie lands were first cultivated the settlers had no implements but an ax, a hoe, and a crooked stick. When the Erie Canal was opened and steamboats were making swift voyages up and down the Mississippi, when the East was offering larger and

Photograph by E. J. Hall

Corn husker and shredder. The machine takes the stalks, removes and husks the ears, and chops up the stalks for cattle food

larger prices for the food of the West, the plow in use in many parts of the United States was a "mere wedge with a short beam and a crooked handle," fitted with a movable share of stone, copper, or iron, wrought to a suitable shape.

In July, 1814, Jethro Wood of New York was granted a patent for a cast-iron plow having the mold-plate share and land side and cast in three parts. This plow was the original of all the plows invented since that time. In 1840 the first subsoil plow came from Scotland, but by 1850 the American plows had become famous for their great simplicity, lightness of draft, neatness, and cheapness, and were being sold throughout Europe.

The crooked stick was superseded by the one-horse plow, and then by the two-horse plow. Here one laborer was dispensed with and a horse added.

Photograph by E. J. Hall

A sulky plow

The two-horse plow soon changed into a sulky cultivator, and the laborer rode. Then came the age of machinery. Within the present generation the steam engine has been used to pull the plow, some of these traction engines having a hundred twenty horse-power. They draw behind them as many as fifty plows, and turn over from seventy-five to ninety acres a day. It was in the fine prairie lands of the West that the steam plow was developed. In addition to the steam traction engine we have now the gasoline engine, and it is said that at least six hundred thousand of these are at present in use in America.

The Grain Elevator. We have now seen the great changes that have taken place in cultivating and harvesting grain. The changes in the methods of

handling the grain for exportation are quite as marvelous. The farmer to-day drives a wagon load of corn, still on the cob, to the nearest railroad siding, where stands what is called the receiving house or the first elevator. The wagon is driven into the building and weighed. Then the front of the wagon is raised by machinery and the corn slides down through a trap door into the shelling room, where it is quickly shelled. It is next tumbled—cobs, husks, grain, and all—into the bottom of an elevator leg, where it is caught up and carried to the top of the building. In a small elevator the leg will carry up a thousand bushels an hour. On reaching the top floor the grain is separated from the cobs, trash, and dust, and poured into the bins. A freight

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A forty-five horse-power tractor pulling ten fourteen-inch plows. The largest tractors haul as many as fifty plows, turning ninety acres a day

car is then backed under the spout of the bin and the grain poured into it until it is full. The corn is

usually bound for Chicago, and soon the car falls in with thousands of others just like it, all bound first for Chicago and probably later for Europe.

The first elevator at the railroad station is comparatively small, many being about twenty by twenty-four feet, but about forty-five feet high in order to load the grain on the cars easily. At Chicago, the car is switched into a tremendous elevator that will hold as much as two million bushels. The door is pushed back, and a power shovel pulled into the car. This has a shoveling capacity of about thirty thousand bushels a day, and empties the car in a short time. Again the grain is run up the elevator boot. It is then tested and graded, and turned into small bins, where it is piled sometimes sixty feet high. The grain is now ready to be distributed to any part of America or of the world. If it is to be shipped to the Southern States, another car is pushed under the bin and is loaded within a few minutes; if it is bound for Europe, a grain boat draws up alongside the elevator, the bin is opened, and the grain poured into the hold until it is loaded.

Such is the method of handling the grain of the West. Thousands of elevators are distributed all over the corn country, the largest, of course, being found in the largest cities and along the lake coast from Buffalo to Chicago. The statement that one of the largest elevators will hold two million bushels of corn can be appreciated only by making a comparison. Seventeen of these elevators could hold all

the corn raised in North Carolina, and three of them all the corn produced in the six New England States.

How the West became the Granary of the World. We are now beginning to see the forces that have been at work changing the Northwest into the world's great food center. The steamboat, the canal, the railroad, and the steam engine provided means for moving the grain from the fields. The

Photograph by E. J. Hall

Sulky cultivators at work in the Fox River Valley, Illinois

improvements made in the plow and the coming of the traction engine made it possible for one man to cultivate vast areas of land. The reaper, the thresher, and the corn-harvesting machinery made it easy to harvest the grain, and the elevator so reduced the cost of handling it that other countries are not even able to compete with this section.

What a change has taken place since the settlers

Revised, 1915

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Map showing the distribution of railroads in the United States in 1916

of America cultivated the land with a crooked stick and complained against the introduction of the plow because of the idea held in those days that iron poisoned the soil! What a mighty transformation has taken place in the business and trade of the world since trains of pack horses carried hides and furs to the cities of the Eastern States, and since grain rotted in the fields of the West while hundreds of people in the East actually suffered for bread!

The writers of history crowd into many volumes the names and deeds of men of valor who have led armies, sacked cities, and put the inhabitants to the sword. They tell also of wise legislators who have adjusted the written law to the needs of the people. But the inventors of modern machinery and the recent students of the soil have probably wrought more wonderful changes in the world's history within the last century and a half than all the generals and lawgivers from Abraham's day to the birth of George Washington.

CHAPTER XV

The Last American Frontiers

The Last of the Prairie Lands. We have seen the value to the new nation of the frontiers and the free lands of the West. We have seen settlers come to the eastern shores, and, following the rivers, push westward into the interior. We have seen colonists cross the mountains, and, as a result, England go to war with France and take the lands west of the mountains. We have seen settlers under Daniel Boone cross over into the blue-grass region and take possession of the great Mississippi Valley. We have seen many millions of people come from Europe, and, joining millions more from the Atlantic Coast States, journey westward across the Mississippi into the valleys of the Missouri and the Platte. Westward this mighty stream of homeseekers flowed. It poured through the mountain passes and appropriated the land along the Pacific coast. However, when settlers reached the Rocky Mountains they had no such difficulty in crossing them and taking possession of the lands beyond as Daniel Boone and his followers had in crossing the Appalachian ridge a hundred years before.

The United States is a large country, but homeseekers may travel to-day from the Atlantic to the Pacific in less time than it took Daniel Boone to go

from North Carolina to Kentucky. Cheap land may be found in almost every state, for often the owner

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Buffalo in Yellowstone National Park. Of the vast herds that once roamed our plains, less than one thousand now remain, carefully protected in our parks and zoölogical gardens

is ignorant of its value, or unable to make it yield abundantly. But there is now very little free land such as was plentiful in the Mississippi Valley a half century ago. Even the great grassy plains of little rain are no longer the home of the cowboy and the buffalo, for the great American desert has been occupied, and irrigation is making it blossom like the gardens of the East. Rich land will never again be so cheap in America, and the owners of such land who cannot make it increase, or even maintain, its fertility stand in the way of the world's progress to-day.

Movement of Population. We have seen how eagerness for free lands sent settlers west by the million; how in the thirties and forties the thirteen original states along the Atlantic gave up their inhabitants and almost ceased to grow; while the West was drawing many of its best citizens from the East and from almost every civilized nation of Europe. But the last two decades begin to tell a different tale.

Settlers always move in the direction of cheap land. If land is free, the rush of settlers in that direction is generally great. The land of the northern Mississippi Valley has practically all been taken up and is so valuable to-day that only those with wealth can purchase it. Homeseekers have had to move on farther and farther west until the Pacific coast has been reached. In the last decade many of the northern states of the Great Central Plain have almost ceased to grow. Indeed, Iowa has lost in population, and Indiana, Missouri, Nebraska, and Wisconsin have grown but very little. Not a state of the great grain region of the corn country, except the Dakotas, has kept pace with the average growth of the United States from 1900 to 1910, as this table shows.

GROWTH IN POPULATION FROM 1900 TO 1910

STATE	PERCENT	STATE	PERCENT
Ohio	14.7	Missouri	6.0
Indiana	7.3	Nebraska	11.8
Illinois	16.9	Kansas	15.0
Michigan	16.1	Kentucky	6.6
Wisconsin	12.8	Tennessee	8.1
Minnesota	18.5	North Dakota	80.8
Iowa (lost)	0.3	South Dakota	45.4

The United States as a whole increased twenty-one per cent in population.

How the Far West is dependent upon the Corn Country. The great gain in population during the last decade has been in the Rocky Mountain and Pacific Coast States, as the following table shows:

GAIN IN POPULATION, AND PRODUCTION OF CORN AND WHEAT PER INHABITANT IN 1910

STATE	PER CENT	CORN IN BUSHELS	WHEAT IN BUSHELS
Montana	54.5	less than 1	20
Idaho	101.3	less than 1	32
Wyoming	57.7	less than 2	10
Colorado	48.0	less than 7	11
New Mexico	67.6	less than 4	2½
Arizona	66.2	less than 2	3
Utah	34.9	less than 1	12
Nevada	93.4	less than 1	10
Washington	120.4	less than 1	31
Oregon	62.7	less than 1	23
California	60.1	less than 1	3

These states, however, do not produce their own bread. They barely average a bushel of corn to the inhabitant. Of wheat, Washington, Oregon, Montana, and Idaho raise a surplus, but the other states do not produce even sufficient for their own population. This is the great stock country of America. We have already referred to sections of it as the land of little rain. In that vast region from the Missouri River westward the lofty plateaus furnish a great grazing country, about one third the total area of the United States. This region furnishes most of the young cattle which are later shipped into the corn country to be fattened and prepared for market. Half-wild horses roam the plains; sheep raising is one of the chief industries.

But it is easy to see that these states lie beyond the great corn belt, and that both men and animals

West of the Missouri River the lofty plateaus furnish a great grazing country, largely given over to cattle, horses, and sheep, and therefore to a certain extent dependent upon the corn country of the Mississippi Valley

must depend to a certain extent upon the corn of the upper Mississippi Valley.

The population of the United States increased twenty-one per cent between 1900 and 1910. The great problem confronting America to-day is how to make the land produce an ever-increasing amount of corn and wheat to furnish bread for the growing population and to supply beef, pork, and horses sufficient for the needs of the people. We have come into an era of study of the soil, experimental work in agriculture, and reforms in education.

Improvements in Agriculture. It was clear to George Washington while he was President that the

From Professional Paper No. 37, U. S. Geol. Survey

An abandoned hillside in North Carolina eroded or worn away by the action of rain

longer the land was cultivated the poorer it became, and that the richest lands were the new fields just cleared of forests. The richest lands in the past

have been near the frontiers. As the old lands "wore out" they were abandoned and new lands cleared. The long stretches of old-field pine and the washed-away hillsides to be seen in the East as well as the South tell the story of man's inability in the past to make the land increase in fertility.

Washington was himself a careful farmer and wiser than most men in his generation, and he repeatedly called attention to these things. As early as 1785 agricultural societies were established in Pennsylvania and South Carolina, for even then food was beginning to grow scarce in some sections of the East. It was natural that the first agricultural schools should be established in the East, and that the founder of all the land-grant agricultural colleges should come from Vermont. Senator Justin Morrill, of that state, in 1862 induced Congress to pass a law allowing to each state thirty thousand acres of public lands for each representative in Congress, to be used in support of agricultural and mechanical colleges. In this way the western lands that were drawing the population of the East from the worn-out farms along the seaboard were at last contributing some of their wealth toward rebuilding the East.

It was the great corn country, however, that made agriculture a science. Here improved machinery was first used and the first agricultural college was established (1857). Here an intelligent attempt was first made to avoid the mistakes of the East, and to save the land from being worn out. It was

a western man, Representative Hatch, of Missouri, who was instrumental in pushing through Congress

Photograph by H. D. Ayer

A class at the Minnesota School of Agriculture learning to judge corn for its growing qualities and food values

in 1887 another bill appropriating the proceeds of western public lands to establish experiment stations in every state of the Union. Thus the western lands contributed to the building up of the lands in the older states.

Population increasing faster than Corn Production. The following table shows the total grain production by decades from 1880 to 1910, and the yield per acre for the whole United States. It will be observed that considerably less corn was produced in 1890 than in 1880, although there were twelve million more people to feed. It was near the end of this decade that experimental stations to study the land

were established in every state of the Union. Since 1890 the work of the agricultural colleges and experiment stations has brought about more intensive farming, resulting in an increased food supply. However, even the very large corn crop of 1910 did not give as much per capita as did the yield of 1880.

CORN PRODUCTION BY DECADES

YEAR	POPULATION	CORN IN BUSHELS	PER CAPITA YIELD IN BUSHELS
1880	50,155,783	1,717,435,000	34.2
1890	62,947,714	1,489,970,000	23.6
1900	75,994,575	2,105,103,000	27.7
1910	91,972,266	2,886,260,000	31.4

When our first census was taken in 1790 only four per cent of the people lived in cities. In 1850 about a third of the population lived in cities, while approximately two thirds of the people were producing food for themselves and the other one third. In 1910 only a third of the population remained in the country, and upon this one third falls the duty of producing enough surplus foodstuff to feed the entire population of America. No wonder farming has become a profitable occupation within the last ten years, and no wonder the whole nation has turned its attention to the improvement of the soil.

The Value of Corn in the World's Commerce. We have already seen that before the days of the railroad a large portion of the grain of the West was converted into cattle and hogs and sold chiefly in eastern markets. After 1850, we find meat products forming a greater and still greater part of the exports. In 1877 the export of grain and meat was

more valuable than the cotton exported, and in 1893 the corn and meat exports alone were equal in value to the cotton.

If we consider the meat derived from cattle and hogs as products of corn, the export value of this one grain in 1893 was about one hundred eighty-five million dollars, while that of cotton was about one hundred eighty-eight million dollars. In 1898 the export value of the corn products was about two hundred eighty million dollars, while that of cotton was only two hundred thirty million dollars. In 1901 the corn products reached the enormous sum of five hundred eighty-five million dollars, while cotton stood at only three hundred thirteen million dollars. This was the highest export value ever reached by American corn in the commerce of the world. From that time its export value has decreased, while that of cotton has been on the increase. In 1911 the corn and meat exported barely reached the value of two hundred million dollars, less than half the valuation in 1901.

The use of corn as a food for man and beast, and the increasing demand for products derived from corn, have caused its price at home to increase more than a hundred per cent within the past ten years. Therefore, the profits in corn at home are becoming so great that the surplus to be exported is growing less annually.

Other Food Centers develop. America taught Europe the value of Indian corn, but has been unable to supply the demand created. Europe

must have Indian corn, however, for England, Belgium, Germany, France, Holland, Denmark, Norway, Sweden, Switzerland, Italy, Russia, and the Balkan States have come to depend upon this grain. We have already seen that America in 1910 was exporting considerably less foodstuff than in 1900. Yet in 1909 Europe imported nearly two hundred million bushels of Indian corn alone. Where did it come from?

In 1881 a new river valley was opened. It was not in North America, but in South America. Suppose you study the geography of the Argentine Republic. The climate of that great nation corresponds to the climate of the United States from Mexico to Hudson Bay. Buenos Aires, its capital, has the same latitude in the south temperate zone as Memphis, Tennessee, in the north temperate zone. In this section of South America three great rivers coming together form the La Plata system, and it is this great river valley that is now supplying the larger part of the corn imported into European countries. In 1878 the production of foodstuff in the Argentine was insufficient for even its scattered inhabitants. Three years later the lands were thrown open to European settlers, and during the past ten years the export of wheat and corn has been considerable. The land yields only about twelve bushels of corn to the acre, an evidence that agriculture in the Argentine is not far advanced as a science. Although only a very small part of this great river valley is as yet under

After Plate VII, Report No. 75, U. S. Dept. Agr.

Loading grain ships, Argentina, by means of a permanent chute or canalita, built out from the high banks along the shore

cultivation, about half of the corn imported into the European countries in 1909 came from the Argentine alone.

In 1911 Sir Thomas Price, of London, made a report to Parliament on the storage and handling of grain in Europe, the United States, and Canada. England, it must be remembered, is a manufacturing nation, and its food supply must come from abroad. The first question that Sir Thomas Price was asked to report on was, Can South Africa grow Indian corn, and what advantage does the South African grower possess over his competitors? His answer to this question is as follows: "It is pleasant to hear the uniform testimony in every country visited—Great Britain, Belgium, Holland, Germany, France,

and Italy—as to the excellence, as a rule, of South African maize in comparison with the maize received from other countries . . . . I was assured that twenty times the quantity, and even more, than South Africa at present exports would find a ready market . . . . The advantages which the South African maize producer possesses that call for special mention are: (1) the good quality that can be grown; (2) the good climate; (3) the low per cent of moisture (in the grain); (4) the good reputation established by careful and impartial government grading; (5) less cost of land; and (6) the preference for colonial maize."

Thus we see that new corn lands are being opened in South America and South Africa, and the center of the world's food supply may pass to one of these continents. We are already importing, according to the report of 1911, about fifteen million dollars worth of foodstuff, which is about six times as much as we imported in 1901. This includes corn, wheat, flour, meat, and dairy products. While the total is small for so large a country as the United States, it has been gradually increasing during the past ten years; and at the same time the price of foodstuff has been gradually increasing.

The Nation's Problem. Although corn is cultivated in every state of the union, two thirds of the total amount produced in America is raised in the seven states, Illinois, Iowa, Indiana, Missouri, Ohio, Nebraska, and Kansas, with Illinois and Iowa as the leading states. As these Western States could

produce this cereal so abundantly, the states on the Atlantic coast to some extent lost interest in its cultivation, preferring to devote their labor to the cultivation of other crops and exchange with the farmers of the West. In the New England States farming even declined, and the emphasis was placed on manufacturing. Thus, after the development of the steamboat, the railroad, and the cotton factory, and the invention of the reaper and other labor-saving devices, the states along the Atlantic coast became dependent upon the West for their food. With the production of corn centralized in a few states, unfavorable weather conditions were likely to

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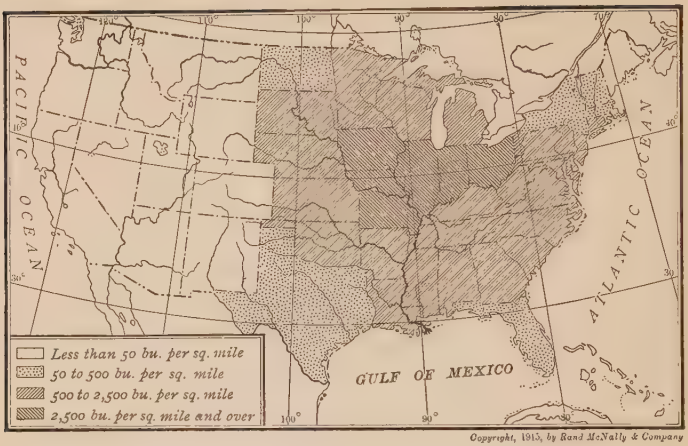
One of the great corn fields on the plains of eastern Kansas


PACIFIC OCEAN
ATLANTIC OCEAN
GULF OF MEXICO
Less than 50 bu. per sq. mile
50 to 500 bu. per sq. mile
500 to 2,500 bu. per sq. mile
2,500 bu. per sq. mile and over
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The production of corn in the United States

diminish the yield considerably in any one year and endanger the food supply of America. Such unfavorable weather conditions did prevail in 1909, and the per capita production of that year fell far below the average, the yield per acre being even lower than that for 1880. Yet since 1880 we have been looking to this section to supply the seaboard and Europe with corn. By 1900 the production in America was not keeping pace with the demands of a growing population. The nation had no longer such vast areas of rich lands in newly formed states. But as population increased the supply of corn must increase. Where should this increasing supply come from?

The Nation turned to the South. Back to the Atlantic seaboard where the first Jamestown colony had cleared the land and planted the first cornfields the word was carried. South Carolina and Georgia

were then producing only ten bushels to the acre, Alabama thirteen, Mississippi fifteen, North Carolina seventeen, and Louisiana nineteen bushels. The states that had produced an abundance of food in 1860 had been impoverished by the Civil War. At the close of that great strife they strove to regain their wealth by the production of cotton. At that time cotton was high and food cheap in the West. But in the nineties, when the price of cotton went down to the bare cost of production, the South had little money with which to buy food. Many farmers were facing financial ruin.

The nation said of the South, "This section of the country is being impoverished because it does not produce its own food supply." Experiment stations, agricultural colleges, and the teaching of agriculture in the schools were beginning to produce their effect when the national Department of Agriculture turned its attention to the South. Then began the corn-club movement which is known in every state where corn is cultivated.

CHAPTER XVI

Farmers' Demonstration Work and the Corn-Club Movement

The Problem. It became quite evident when the last prairie state was settled and the population was pouring into the grassy plains beyond the corn belt that the center of the food supply could not move much farther westward. As the population continued to increase faster than the increase in the production of corn, it became evident that more land must be devoted to raising food, and that the old lands must be made more productive. But where were more lands to be found?

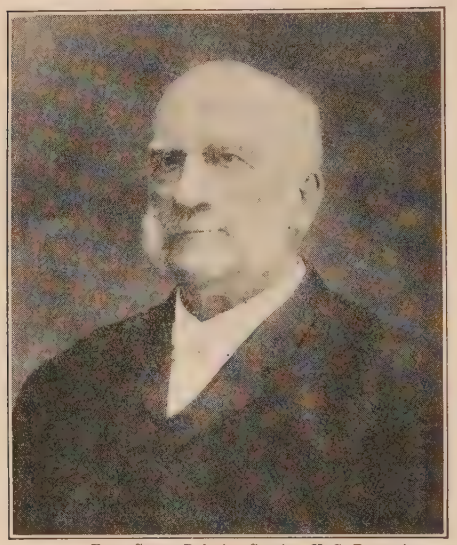
The South was largely an agricultural section, and in 1910 nearly half of the farming population of the United States lived in the sixteen Southern States. This half of the farming population was living on land that was not producing as much food in 1890 as it had been in 1850, though the population had nearly doubled. Some of the Southern States were producing an average of only ten bushels of corn to the acre. The best lands of the southern coastal plain were planted in cotton; but even the corn lands of the piedmont sections were decreasing in fertility. It was evident to the national Department of Agriculture that if the South could produce its own food supply it would add at least five

hundred million bushels of corn annually to the nation's wealth.

Cotton was still king in the South. In the piedmont sections of the Southern States the cotton factory was drawing the laborers from the farms, and thousands of tenants and many landowners gave up their land and sought employment in the factory for themselves and their wives and children. The best agricultural skill was devoted to raising cotton or tobacco, while the corn in many sections was carelessly planted and indifferently cultivated. As a result the South was not producing more than half its food, and was buying the remainder from the fields of the West. When the price of cotton dropped, in 1897, to less than five cents a pound, it was a heavy burden that fell on the South, and the problem, how could the South grow its own food supply and at the same time raise sufficient cotton for the world's need, was fairly presented. This question was answered largely by one man, who has been called the "Missionary Bishop of American Agriculture." His work has been referred to as "the greatest single piece of constructive educational work in this or any age."

Seaman A. Knapp. While the South was engaged in one of the most destructive wars of the eighteenth century, a war which was to break up the old plantation system and entirely change the methods of cultivating the land, a young man from New York State, following the westward migration, moved into the new state of Iowa. This young man was

Seaman A. Knapp. He was born in Essex County, New York, December 16, 1833. It was his purpose to become a teacher, and after graduating from Union College, Schenectady, New York, he entered his chosen profession. But failing health caused him to change his plan, and in 1865 he took the advice of Horace Greeley, so often given to young men of that day, "Go West, young man, and grow up with the country."



From States Relation Service, U. S. Dept. Agr.

Dr. Seaman A. Knapp, the "Missionary Bishop of American Agriculture"

He went to Vinton, Iowa, at the age of thirty-two, and settled on a farm, where he learned how to produce corn and to breed successfully Shorthorn cattle and Berkshire hogs. He introduced heavy draft horses to his community and helped to organize the first live-stock association in the state. He experimented with improved machinery and labor-saving devices, and proved the value of seed selection in increasing the yield of corn. A few years after he settled in Iowa he met another farmer named

James Wilson, who afterwards became the Secretary of Agriculture of the United States, and together they led the movement for agricultural reform in their state. Dr. Knapp organized and edited *The Western Stock Journal and Farm*, and later became professor of agriculture, and finally president, of the Iowa State College. But again his health failed, and he was forced to give up college work.

This time he turned his face to the South. After organizing a great development company, he bought for it a million acres of land in southwestern Louisiana, and sent the following invitation all over the Northwest: "Come South, young man, and grow up with the country." In Louisiana and Texas he conducted demonstrations in rice growing and diversified farming for the benefit of native farmers and immigrants. In 1898 his old friend James Wilson, having become Secretary of Agriculture, selected Dr. Knapp to visit China, Japan, and the Philippines to make investigation in rice growing. Four years later he was again sent to the Orient and to Europe to study agricultural methods.

Farmers' Coöperative Demonstration Work. In 1902, while Dr. Knapp was studying farm conditions and agricultural methods abroad, the Mexican boll weevil appeared in Texas. Its ravages were so severe that many people thought Texas would soon cease to be a great cotton-producing state. Tenant farmers abandoned their growing crops; owners in many places were disheartened; most direful results were prophesied; and a condition of fear and panic

hovered over the boll weevil territory. In 1903, Secretary Wilson sent Dr. Knapp to Texas to study this boll weevil section. His first work was to organize the farmers of the community. This organization, begun in such a small way, is known to-day as the Farmers' Coöperative Demonstration Work, and is the greatest agricultural force in the South.

The demonstration work began on a small farm near Terrell, Texas, where neighboring farmers met Dr. Knapp in field meetings. At the close of the year he had proved to them that cotton could be grown in spite of the boll weevil. So successful was his work that he was urged to extend his methods throughout the whole country devastated by the pest. The next year, having at his disposal funds furnished by Congress and local business men, he appointed a few agents and began to organize different counties in Texas. The work soon attracted the attention of the entire country. Congress enlarged its appropriation, local aid was increased, and the work was extended into Louisiana and Mississippi.

In fighting the boll weevil Dr. Knapp taught the farmers the value of crop rotation, careful seed selection, and proper planting and plowing. New methods of farming were the result. A larger yield of corn due to crop rotation came from every section that Dr. Knapp visited. The boll weevil spread from Texas, Louisiana, and Mississippi into Oklahoma, Arkansas, and Alabama. But Dr. Knapp was greater than the weevil, and soon many planters

in the states which the boll weevil had entered produced not only more cotton but also more foodstuffs than before. In a few years this great work had covered the entire South, had employed a force of a thousand agents, and had an enrollment of a hundred thousand farmers, besides seventy-five

From States Relation Service, U. S. Dept. Agr.

"Seed corn day." The farmers have brought their best ears to the demonstration agent, who will instruct them in selecting ears for next year's planting

thousand boys in the corn clubs and twenty-five thousand girls in the canning clubs.

The old plantations of the South were beginning to take on a new life. Those worn-out lands that had first raised corn for the pioneers, before the West was opened, now felt the touch of a master, and a new era was dawning in the South. Every state began to show an increase in the average corn

production per acre, and every state was learning this lesson which Dr. Knapp taught wherever he went—that it is the business of the farmer first to make his living on the farm, and that it is false economy to raise only a money crop and then expect to buy corn in a distant state. He taught the southern farmer not only how to raise cotton and corn but also how to find out the cost of his crop and whether he was making or losing money. He said, "Agriculture may be divided into eight parts; one eighth is science, three eighths is art, and four eighths is business management." Dr. Knapp discussed the economics of the situation with merchants and bankers. He showed them that the successful farmer is not a one-crop man—that to make his farm pay he should not only raise corn and live stock, but should grow crops of cotton which would bring him in ready money. Then he would be able to purchase not merely the bare necessities of life, as heretofore, but also the things that make for comfort and even for luxury.

Photograph by E. J. Hall

Florida corn. The result of new methods in farming

Boys' Corn Clubs. In the course of his work Dr. Knapp saw that it was an easy matter to interest the schoolboys of the South in practical agriculture. He learned that Mr. W. H. Smith, then Superintendent of Public Education in Holmes County, Mississippi, had in 1907 organized the schoolboys of that county into corn clubs, and that they were already making some remarkable demonstrations in corn production. This idea of the corn clubs for schoolboys had its beginning several years before this in the Northwest, but when the idea was introduced into the South the effect was at once noticeable. Superintendent Smith was having each boy cultivate an acre of land at home under his direction. The remarkable showing made by these boys gave Dr. Knapp an idea, and during the next year corn clubs were organized in several counties of Mississippi. The first efforts to enlist the boys of the public schools were so successful that in 1909 Dr. Knapp began a systematic effort to organize a few counties in every southern state. During that year 10,543 boys were enrolled. In the next year nearly fifty thousand boys joined the clubs.

One South Carolina boy, Jerry Moore, following Dr. Knapp's instructions, astounded not only the South but the nation and even the world by his marvelous record. He produced 228¾ bushels of corn on one acre, and this was in a state whose average yield to the acre in 1880 had been only ten bushels, although the average for the United States was twenty-eight bushels in 1880 and twenty-

seven in 1910. When these two amounts, $228\frac{3}{4}$ and ten, are placed side by side, and it is really

From Bulletin "A"-75, U. S. Dept. Agr.

Jerry Moore, the fifteen-year-old South Carolina boy who in 1910 set the world's record by raising $228\frac{3}{4}$ bushels of corn on one acre

understood that they represent the production of two acres of ordinary land in the same state before and after Dr. Knapp's magic touch, it is easy to see what his work in the South meant. This was perhaps the greatest yield of foodstuff to the acre that the world had ever seen. Many farmers of the South did not produce that amount on twenty-five acres of land. Through the boys' corn clubs the South learned the astounding truth that one acre of land, well cultivated under favorable conditions, will yield corn enough both for the use of a whole family for an entire year and for the feed of a horse, cows, hogs, and poultry.

In 1911, when Dr. Knapp died, the corn clubs had extended into every southern state and many other states of the Union.

In that year sixty thousand boys of the South entered the contest conducted by the corn clubs. Although the weather conditions were not favorable, as in the past years the records made by the boys were none the less remarkable. The following account shows what some of these boys accomplished.

The Remarkable Results. The national Department of Agriculture report says: "Perhaps there have never been three better records than those of Junius Hill, Bennie Beeson, and Ben Leath. Junius Hill produced $212\frac{1}{2}$ bushels at 8.6 cents per bushel; Bennie Beeson, $227\frac{1}{16}$ at 14 cents per bushel; and Ben Leath, $214\frac{5}{7}$ bushels at 14.2 cents. . . . It is noteworthy, also, that hundreds of other boys in the corn clubs throughout the South did nearly as well. . . . The following facts will give some idea of the records made: Fifty-two boys in Georgia received diplomas, signed by the governor and other officials, for producing more than 100 bushels per acre apiece at an average cost of less than 30 cents per bushel; 21 Georgia club members from the seventh congressional district alone grew 2,641 bushels at an average cost of 23 cents per bushel; 19 boys in Gordon County, Georgia, averaged 90 bushels, 10 of them making 1,058 bushels. The 10 boys who stood highest in Georgia averaged 169.9 bushels and made a net profit of over $100 each,

besides prizes won. In Alabama 100 boys averaged 97 bushels at an average cost of 27 cents. In Monroe County, Alabama, 25 boys averaged 78 bushels. In Yazoo County, Mississippi, 21 boys averaged 116 bushels at an average cost of 19.7 cents. In Lee County, Mississippi, 17 boys averaged 82 bushels at an average cost of 21 cents. Sixty-five boys in Mississippi averaged 109.9 bushels at an average cost of 25 cents. Twenty Mississippi boys averaged 140.6 bushels at an average cost of 23 cents. Ninety-two boys in Louisiana grew 5,791 bushels on 92 acres; 10 of these boys went above 100 bushels, although the weather conditions were very unfavorable in that state. In North Carolina 100 boys averaged 99 bushels. In the same state 432 boys averaged 63 bushels. In Buncombe County, North Carolina, 10 boys averaged 88 bushels. In Sussex County, Virginia, 16 boys averaged 82 bushels. Fifteen boys in the state of Tennessee produced 127 bushels each to the acre."

Suppose we compare these results with the average production in the same states: Alabama, nineteen bushels; Georgia, fifteen; Mississippi, twenty-one; Louisiana, thirty; North Carolina, nineteen; Virginia, twenty-nine; and Tennessee, twenty-six.

In 1890 the South produced barely one fifth of the corn of the country. In 1912 it was producing over one third. The power that this increased corn production gives the Southern States is manifest. In addition to producing the world's supply of cotton the South is learning from the teaching of Dr. Knapp

and others engaged in the demonstration work to produce its own breadstuff, meats, dairy products,

From States Relation Service, U. S. Dept. Agr.

A field meeting of corn-club members for the purpose of selecting corn for seed

and domestic animals of all kinds. However, the South still buys annually three million bushels of foodstuff from the West.

How the Corn Clubs were Organized. The national Department of Agriculture, with the assistance of the General Education Board, has placed in each state a director of corn clubs whose business it is to organize clubs, instruct the boys, and supervise the planting and harvesting of the grain.

In many of the Southern States the corn clubs have become a regular part of the public-school system. In order to keep the boys interested,

valuable prizes of various kinds are offered. These as a rule come from the citizens of the section in

From States Relation Service, U. S. Dept. Agr.

Southern corn-club prize winners at Washington, D.C. Each boy was awarded a diploma of merit by the Secretary of Agriculture

which the club is located. For example, one thousand dollars in gold was offered in Oklahoma to the one hundred twenty boys making the best records in the state, and in every county throughout the South where clubs were organized, merchants, farmers, manufacturers, and school teachers offered prizes to the boys, sometimes in money and sometimes in improved stock. The National Corn Club gave the most successful contestant in each state a trip to Washington.

The visit to Washington was worth much to the boys and to the corn-club movement. The boys spent a whole week at the capital. They were shown Mount Vernon, the government buildings, and other points of interest. They were received at the White House by President Taft, who talked with them about their work in the clubs. Before leaving for home they were entertained by Mr. Wilson, Secretary of Agriculture, who awarded to each a diploma bearing the seal of the Department and the signature of the Secretary. In nearly all the Southern States diplomas signed by the governor and the state superintendent of public instruction are given to the boys who make as much as seventy-five bushels per acre at a reasonable cost of production. Prizes worth more than forty thousand dollars were offered in the six hundred counties organized, but those most valued were the diplomas issued by the Secretary of Agriculture and by the governors of the different states.

Result of the Farm Demonstration Work. The one great lesson derived from the farm demonstration work in the South was proof that the Southern States are well adapted to the production of corn and that the southern farmer can and should grow enough corn for every possible need of the farm. The work of the boys' corn clubs has proved that it is more profitable in the South to produce corn and meat than to buy these absolutely necessary foods, even with cotton selling at fifteen cents a pound.

It has been demonstrated, furthermore, that the

low yield of corn in the South is due largely to the lack of care in selecting seed and preparing seed beds

From States Relation Service, U. S. Dept. Agr.

Boys' Corn-Club Exhibit at the state fair, Richmond, Va.

before planting. The prizes offered were merely for the purpose of arousing and maintaining interest, while efforts were made to instruct the boys in the following points of farming: deep fall plowing, pulverization of the soil, careful seed selection, suitable fertilizer, intensive cultivation, increase of humus, economical use of more horse power and better implements, and the keeping of farm accounts.

Corn is a semi-tropical plant, and, other things being equal, it should thrive better in the Southern States than in the Northern States. As we have

seen in a previous chapter, the South falls far behind every other section of the country where any serious attempt is made to cultivate this grain. Nevertheless, it has been demonstrated that with proper preparation and cultivation as much corn to the acre can be produced in the South as has been grown heretofore in the corn belt.

Business Management. Years ago commercial schools were established throughout the world for the purpose of training the banker, the merchant, or any other business man engaged in commercial and trading pursuits, in the art of business management peculiar to his occupation. Each particular business has a fairly accurate method of keeping accounts of the buying and selling, of the profits and losses, of the wastes and checks, and from these accounts one is able to tell whether the business is gaining or losing. Within recent years the leading universities of the corn country have established departments which give instruction in the art of business management of the farm. Dr. Knapp taught the South that good business management is responsible for about half the prosperity of the farmer. It is only a small percentage of the farmers who have as much skill in buying and selling as have the merchant and banker. The farmer does not keep up so well with the world's prices of his commodities, with the cost of transportation, and with supply and demand. It is too often the case that the farmer does not know whether he is losing or making money by his methods of cultivating the

soil. This absence of business management has accounted in large measure for the poor lands and the shiftlessness of the tenant class. It also accounts for the abandoned farms and the rush to the cities. Looking still farther, it is not very difficult to see that to a great extent it accounts for the reduction in food supply and for the high cost of living.

Photograph by E. J. Hall

A model dairy farm in the South. The result of increased corn production and good business management

In 1912 corn was selling in South Dakota for forty-one cents a bushel and in Iowa and Illinois for fifty cents a bushel. In South Carolina it was bought for about ninety-six cents a bushel and in Georgia for ninety-two cents a bushel. As the freight rate from the Northwestern States to the Southeastern States is only about twenty cents a bushel, it can easily be seen that the consumer in South Carolina paid to the middleman who bought

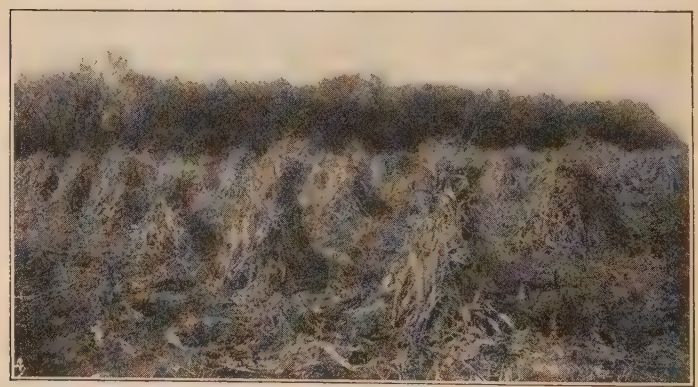
the corn for him almost as much as the corn was worth in the fields where it was produced.

In addition to buying and selling, good business management on the farm must consider crop rotation, fertilizer, freight rates, and the best machinery. The farmer must understand why good roads are so valuable to his community and why poor roads are an expense because of the care of his horses, the wear on his vehicles, and the cost of getting to market. He must consider the influence of the public school in his community and of the general culture level of his neighbors. Ignorance is the greatest barrier to progress, and nowhere is it so destructive as in rural communities, for here it strikes at the very heart of the nation, and the decline of the farms, the diminishing food supply, and the high cost of living are indications that ignorance is still abroad in the land.

CHAPTER XVII

Varieties of Corn

Favorable conditions for Corn Production. While Dr. Knapp was teaching the South the value of corn production and how to increase the yield, other nations of the globe were likewise studying this American grain. The world had learned this fact, that similar soil and climatic conditions are capable of producing similar plants. After Chicago became the center of the world's food supply and Europe began to depend more and more upon the



From Dept. Agr. and Labor, North Dakota

A North Dakota corn field. Rich, loamy soil and carefully selected seed have made corn a profitable crop even in the northernmost counties of this state

food of America, the different nations of the world began to make a more thorough and scientific study

of soil and plants. It was discovered that corn grows best in a rich, loamy soil in a climate of abundant sunshine and rainfall. A region where the summer is comparatively long, from four and one-half to seven months; where the possibilities of frost during the crop's growth are reduced to a minimum; where the soil is rich in the elements of plant food and is not too stiff and compact to allow of ready drying after rains by free drainage; where the summer rains, though copious, are not too heavy and frequent—such a region is ideal for the cultivation of maize. All these conditions are found in varying degrees throughout the United States save in the far western portion, where the rainfall is small. The same favorable conditions are found likewise in many sections of South America, Europe, Asia, Africa, Australia, and the islands of the Pacific.

Extent of its Cultivation. Maize is the only cereal which was introduced into the Old World from the New. Being a very productive crop it yields, under equally favorable conditions, fully twice as much grain to the acre as does wheat. Its cultivation, therefore, spread very rapidly in the tropical and the warmer temperate parts of the Old World. Shortly after Columbus discovered America it was introduced into Spain and Portugal, and its cultivation spread into Italy and southern France. In Portugal it is mixed with rye and is the chief bread food of the peasant or poorer class, and for several centuries the Italians have been living chiefly on *polenta*, a sort of corn-meal mush.

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The corn-raising areas of the world

There is no other cereal that can be produced in so many different climates and so many different kinds of soil and yield so abundantly. Its cultivation has spread to Egypt, where it forms the staple food of the peasantry. There the same soil produces three crops a year—in the autumn maize is cultivated, and after being followed by wheat in winter the same land produces cotton or rice in the summer. The Egyptians use the entire plant, for in that warm climate the large and very hard stalk is used in building houses.

It was discovered during the last half of the nineteenth century that Roumania, possessing similar soil and climate to that found in many portions of the United States, could produce corn more profitably than wheat. As a result Roumania has become the leading corn country of Europe. About seventy per cent of the people of that country engage in agriculture, and corn is not only the leading crop but is becoming the leading food, likewise. Roumania ranks third in the export of that cereal. The cultivation has spread to Thessaly in Greece, to Hungary and the country around the Danube, and to many sections of Russia.

Maize has been introduced into Asia, also. Turkey and parts of India and China, and the inhabitants of the uplands of the Philippine Islands are learning the value of this great American cereal. It has recently been introduced into South Africa, and as the demand has increased at home for the American crop, the European nations that have colonies in

South Africa are interested in efforts to introduce Indian corn into that section of the globe. It is already predicted that in the near future Africa will supply Europe with this food. Because of unfavorable climatic conditions, England cannot raise Indian corn; but the English government is active in extending the cultivation throughout her South African colonies. Certain sections of Australia and South Africa have already been exporting great quantities of corn to Europe, and it has become the leading crop in some parts of New South Wales and Queensland.

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Grain elevators on the water front in the Argentine. Elevators are gradually replacing the canalitas

In South America it is an important crop of the Argentine and parts of Chile, and is cultivated in

nearly every South American country. It is the leading crop of Mexico and Central America, and the natives of the West Indies have depended almost entirely upon it since long before the days of Columbus. Although originally a tropical plant, it is so easily adjusted to various kinds of soils and climates that certain varieties are now grown in the cold lands of Alaska, Russia, and China.

Varieties of Corn. It is said that more than three hundred distinct varieties of corn are in existence to-day. Some come to maturity in two months, others require seven months; some are almost as many feet high as others are inches high, and some have kernels eleven times larger than others. The varieties vary in shape and size of ears, in color of the grain,—which may be white, yellow, red, purple, or striped,—and also in physical characteristics. These many varieties, however, are reduced to six general classes, which are grown primarily for the grain, and the distinguishing characteristics are based on the grains or kernels.

1. *Flint Corn.* This variety is cultivated in Canada, northern United States, and in the colder regions of the temperate zones. The grain, as a rule, is shorter, rounder, and smoother than the grain commonly seen throughout this nation. The stalks are usually small, and the ears are borne near the ground. The flint corn matures quickly and is best adapted to regions where the summers are short.

2. *Dent Corn.* Dent corn is the kind commonly grown in the United States and in the milder climates

of the temperate zones. But the varieties differ widely in the size of the plants and the appearance of the ear. Even the color of the grain varies greatly, being generally white, yellow, or red. Dent corn comprises all the varieties commonly grown in the fields of the United States; the bulk of the American corn, in fact, is of this variety. It consists chiefly of loosely arranged starch grains, and the shrinkage of this loose starch during ripening causes the depression, or dent, which gives it its name. The grain is much flattened and wedge-shaped, and longer than it is broad.

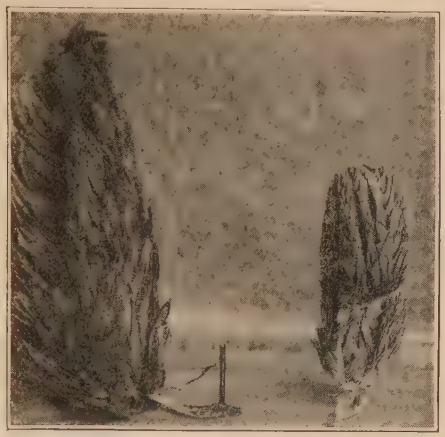
3. *Sweet Corn.* This is preëminently a garden vegetable, the ear being used before the grain hardens, when it is well filled but soft and milky. It is often cooked and served on the cob, but when it is canned it is cut from the cob. Canned sweet corn is an important article of domestic commerce in the United States and Canada. The plant is very small, and bears many small ears which mature early.

4. *Pop Corn.* Pop corn is a variety that is without the floury starch so valuable in other varieties, hence its value as an article of commerce among confectioners. When heated it pops open, and is very pleasant to eat.

5. *Soft Corn.* This is the original variety in use by the Indians when Columbus discovered America, and it is called soft corn because the inner, nutritive part of the grain is soft and easily ground. It was suited to the needs of the Indians in the days when

the mortar was the only corn mill. This variety is not cultivated to any great extent in the United States to-day. The ears are small, and the grains are usually small and round.

6. Pod Corn. This variety is a curiosity. Each grain is inclosed in a small shuck, and the whole ear is wrapped in an outer shuck. It is believed that the original form of maize was similar to this curious wild variety.



Photograph by E. J. Hall

The wild corn from which all varieties of corn are supposed to have developed

The Origin of Corn. The origin of Indian corn is unknown. However, like all other cereals, it belongs to the grass family, and the theory is held by many that it is derived from a Mexican fodder grass known as *teosinte*, a closely allied plant which, when crossed with maize, yields a maize-like hybrid. Each grain of the other cereals is, as is well known, inclosed in a small shuck, and the fact that one variety of maize, the pod corn, has the individual shuck for each grain gives strength to the belief that this was the original form. The grain of other cereals, however, appears in the top of the plant, while the grain of maize is in a large ear on the

stalk, sometimes near the ground and sometimes near the top of the plant. From the pod corn we come to the soft corn of the Indians, and from this soft corn we can trace the history of the many varieties in existence to-day.

How Varieties are Formed. The fact that the corn plant is capable of adapting itself to a great variety of climates and soils is sufficient to show that it is capable of providing very readily a number of varieties, since cultivated plants, when transferred from one kind of soil and climate to different kinds of soil and climate, will as a rule form a different variety. It is easy to see, therefore, that chief among the agencies in producing different varieties of corn are soil and climate, since we could hardly expect to find the same variety in Alaska that is grown in Mexico. Moreover, the very nature of the corn plant subjects it to ready changes and varieties. Suppose we notice the blossoming of the corn. Fine, silky threads may be seen hanging exposed from the end of the green ear. At the top of the stalk is the tassel. The fine pollen dust of the tassel is readily blown about by the wind and sifted on the silky threads hanging from the ear of the corn. This pollen dust fertilizes the ear and produces the grain. Where different varieties of corn are growing in the same field, the pollen from the tassel of one variety may be carried by the wind or by insects to the silky pistils or threads of another, and sometimes even produce different varieties of kernels on the same ear. So easily is the pollen

dust carried about, and so exposed is the ear to receive it, that the grain is constantly undergoing changes, being modified, and producing new varieties. Other varieties are formed by selecting the seed properly. This method is used to such advantage that it is considered in a separate section.

From Farmers' Bulletin No. 415, U. S. Dept. Agr.

A good method of seed selection. Ears are taken from only those plants that have produced heavily under average conditions and in close competition with less productive plants in the same locality

It is easy to see, therefore, that a grain which will so easily form new varieties and so readily adapt itself to so many different kinds of soil and climate will, in the course of a few centuries, produce in different parts of the world varieties that are wholly unlike in many particulars.

Improving the Variety by Seed Selection. The one fundamental principle underlying corn production

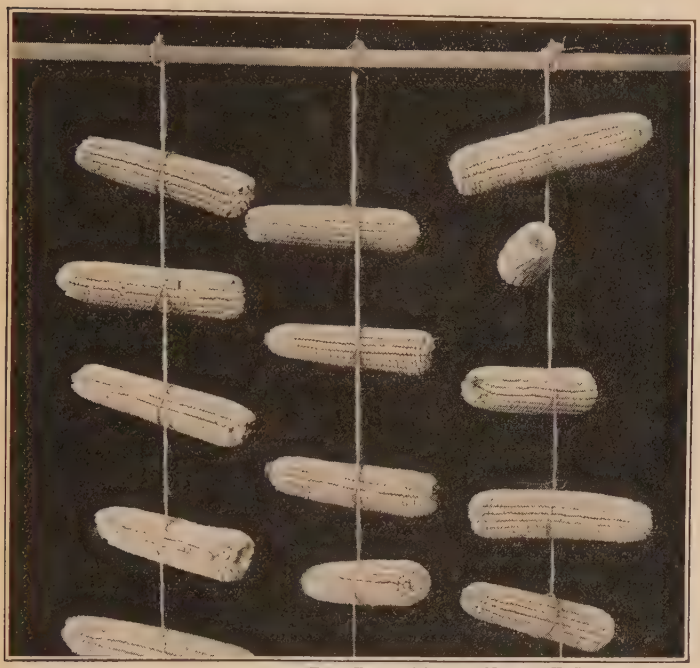
and the improvement of the variety is found in the proper selection of seed corn. In the first place the seed must be suited to the locality. Dent corn is the common variety used in the United States, but there are several varieties of this class, and it has been demonstrated that the proper selection and care of seed corn will in itself increase the average yield per acre by many bushels.

Photograph by King Prints Co.

Corn smut. In selecting seed ears the farmer avoids parts of the field where smut appears on the stalks

Dr. Knapp, in his instruction to southern farmers, advised them to select stalks that are free from disease of every kind and are not in the immediate neighborhood of diseased stalks. If a prolific variety, the stalk should have at least two good ears upon shanks four or five inches long, and these should show a decided tendency to turn down. As soon as the corn is sufficiently dry it should be carefully gathered and housed. If there are two good ears on the stalk,

both should be selected. But if one is poor, only the good one should be taken. Moreover, only those ears that have the ends well covered with a close-fitting husk should be gathered for seed corn, since



From Farmers' Bulletin No. 415, U. S. Dept. Agr.

Seed ears strung in a cool, dry place as soon as gathered will give a greater yield than if stored in a heap with the crib corn

this is a very effective protection against the weevil. The ears should be stored in a cool, dry, well-ventilated place, and not in too great bulk, so there will be no danger of heating. But it should always be kept from freezing.

According to reports from the national Department of Agriculture, seed corn should be selected

From Agricultural Extension Service, Ohio State University

Corn tester or germinator. By watching these young plants the farmer can judge the growing qualities of his seed

in the South the last of August and in the North early in September, and no farmer should permit October to pass without having sufficient seed corn for at least one year's planting stored where it cannot be injured by unfavorable or unexpected weather. It has been proved that seed corn, separated from the corn in the crib and put in a cool, dry place, will give a greater yield than if the same corn is stored in a heap with the crib corn. This difference alone in the treatment of seed corn increased the yield in one particular instance about seven per cent, or for every hundred bushels raised the yield was increased on an average of about seven bushels.

Within the last few years more attention has been paid to the selection of seed corn in all states where corn is the leading crop. The various experiment stations send out special corn trains in charge of trained experts explaining the different grades

and varieties best adapted for use in different localities. The necessity of having the right variety is seen in the fact that corn is planted in various sections of the United States from the twentieth of March to the twentieth of May, and ripens from September to October, according to the weather and climate. In the northern part of the United States it matures in from seventy to ninety days, growing from three to four feet tall, while in the Southern States, Mexico, and Central America it sometimes reaches a height of twenty feet or more, and requires six months to mature.

For a good example of how to test the value of seed corn, see page 282.

How Good Soil improves the Variety. It is not economical to grow corn on poor land. The Eastern States as well as the Southern States have discovered this fact, and in many sections of the South farmers had almost ceased to cultivate the grain when Dr. Knapp began his work. But it was discovered that the soil could be improved, and when improved, as the boys' corn clubs demonstrated, the land would yield abundantly. The corn plant has no long tap root, but it has a great many fibrous roots that branch out in every direction and fully occupy the soil to a depth of from two to four feet. The great body of its feeding roots, however, are found from four to eighteen inches below the surface. It requires, therefore, a good seed bed of from eight to ten inches deep, and this can be obtained only by breaking the land deep.

A very deep seed bed well filled with manure is of more importance in the South than in the North because of the high temperature and consequent greater evaporation. To make its largest yield, corn requires not only a deep seed bed but a large amount of humus in the soil. Consequently most land needs some previous preparation, such as the plowing under of a green crop or the use of stable manure. Even if the soil has a fair amount of vegetable matter in it, good crops of cow peas turned under in the fall, or vetch or crimson clover turned under in the spring, will greatly increase the yield. Very poor lands should not be planted in corn. Such lands planted in peas, beans, or other forage crops will produce more feed and at the same time improve rapidly in fertility.

From Dept. Soils, Missouri College of Agriculture

Corn raised on a plot of ground that had not been treated with fertilizer

After a deep seed bed containing humus is prepared, farmers are advised to go over the land with

a disk or section harrow two or three times before planting, and repeat with harrow immediately after planting and again after the crop is up. The object sought is to pulverize the soil thoroughly and thus prevent the formation of any crust or the growth of weeds. If it is possible for boys to cultivate over two hundred bushels of corn to the acre at a very small cost per bushel, it certainly would pay the farmer to devote all his time to two or three acres and make them give up the yield necessary for the needs of his family and stock.

From Dept. Soils, Missouri College of Agriculture
Corn raised in soil treated with lime, legume, phosphorus, and potassium

The Use of Fertilizer. The productive capacity of practically all soils in good physical condition is measured by the available supply of three necessary elements: phosphoric acid, potash, and nitrogen. Of course there are many other elements that the plant takes up from either the air or the soil, but these are the three that are soon removed from the

soil unless the farmer has some way of restoring the amount removed. Professor Cyril G. Hopkins, of

Photograph by King Prints Co.

Testing fertilizers for corn and other crops. This is part of the work done for the farmers at experiment stations

the University of Illinois, has demonstrated that an acre of corn in that state producing a hundred bushels of grain will take from the soil in one year one hundred forty-eight pounds of nitrogen, twenty-three pounds of phosphorus, and seventy-one pounds of potash. The total market value of these three elements removed from the soil is $29.22: nitrogen, $22.20; phosphorus, $2.76; and potash, $4.26.

Suppose a piece of land two acres in size when planted for the first time in corn produces a hundred bushels. According to the above figures, at the end of the first year it is worth nearly thirty dollars less

than before it was planted. Of course, the farmer has received one hundred bushels of corn, valued at about sixty dollars. But suppose the land is planted from year to year in corn. Soon it will contain an insufficient amount of these elements to produce a hundred bushels, and the yield will be less. From this time on the land will degenerate rapidly. It would have to be very rich land indeed at the beginning to be worth cultivating at all after a period of ten or fifteen years.

According to Professor Hopkins's experiments an acre of land that will produce one hundred bushels of corn would produce four tons of clover hay or three tons of cow-pea hay containing the following amounts of nitrogen, phosphoric acid, and potash:

	Pounds			Value
	Nitrogen	Phosphoric Acid	Potash	
4 tons clover hay . . .	160	20	120	$33.60
3 tons cow-pea hay .	130	14	98	27.00

These two classes of hay really take more from the soil than corn, but the roots and stubbles left in the field contain more than is taken away in the hay. Therefore, these crops have a tendency to enrich the soil. If the second year the land is planted in leguminous crops, the hay is not quite so valuable as the corn, but the land is in better condition for raising a corn crop the third year. However, by planting corn on the same land every other year, the necessary elements will be removed after a while, although it will take nearly twice as long. By growing legumes with corn the nitrogen

content of the soil may not only be maintained but enriched, since these plants have the power to draw nitrogen from the air.

The same land planted in wheat or oats will take from the soil only about twenty dollars worth of these elements. But the stubble and straw left in the field return probably a fifth of this amount; and if these crops are followed in the same year with a legume, the land is only a little poorer than it was at the beginning of the year. If the legumes are plowed under in a green state, the land is richer, but the farmer loses the value of the hay; and if he would keep the hay, it is necessary to use fertilizer in order to keep the land from degenerating.

It can thus be seen how injurious to land are ignorant farm tenants. It requires more skill to maintain a high productivity of the land than it does to run a store, operate a mill, or make laws for a people. Here ignorance is the greatest curse, and it is the more damaging because it takes a number of years to see the full effect of ignorance on the land.

CHAPTER XVIII

Corn: The National Grain

The Value of Corn. The corn crop of America in any one year is the most valuable asset of this nation. When we say that it is worth nearly two billion dollars we do not really comprehend its importance; but it is sufficient to pay off the national debt, buy all the gold and silver mined in all the countries of the world in a single year, and still leave a considerable sum. The entire cotton crop as a rule is only about half as valuable as the corn crop, and all the other crops combined are worth barely half as much. This is a great manufacturing age, but all the iron and steel output of a single year in the United States is not worth nearly so much in actual dollars and cents as a year's corn crop. Its value for eight such years as that of 1910 would be sufficient to buy all the railroads of the United States, including their costly stations and all their rolling stock. In thirteen years it would replace the present banking capital, surplus deposits, and the entire money in circulation; and it is so easy to cultivate that millions of bushels can without extra labor be added to our crop simply by a modification of the corn planter or by even separating the seed corn from the corn in the crib. It is not only the most valuable crop produced in America, but it is

becoming more and more a necessary food for civilized man, and as a food for horses, hogs, and other domestic animals it is by far the most important on this continent.

When we speak of the amount of corn produced in a single year, the tremendous quantity expressed by the term "billions of bushels" is but vaguely understood. But suppose we look at it this way: By placing the 1910 corn crop of the United States in wagons, fifty bushels in each, and allowing twenty feet of space for each wagon and team, the wagon train of corn would extend in length nearly two hundred thousand miles, or more than nine times around the world. Notwithstanding this immense amount, we are not producing to-day even as much corn as we need, and every state in the Union, backed by the national government, is studying the land, improving the seed, training teachers, and establishing schools for the purpose of increasing production. But why is the corn plant so valuable?

The most common Corn Products. The number of uses to which we are putting this Indian plant is surprising. First, as food for man, we have corn meal, grits, hulled corn and hominy, flourine (made by mixing flour and meal), roasting ears, canned corn, pop corn, and a variety of breakfast foods, some of which are found on our table nearly every morning. As food for stock we have shelled and cracked corn, a meal produced by grinding corn and cob together, fodder, ensilage (the whole plant), corn-stalk meal, corn bran, gluten meal, and oil cake.

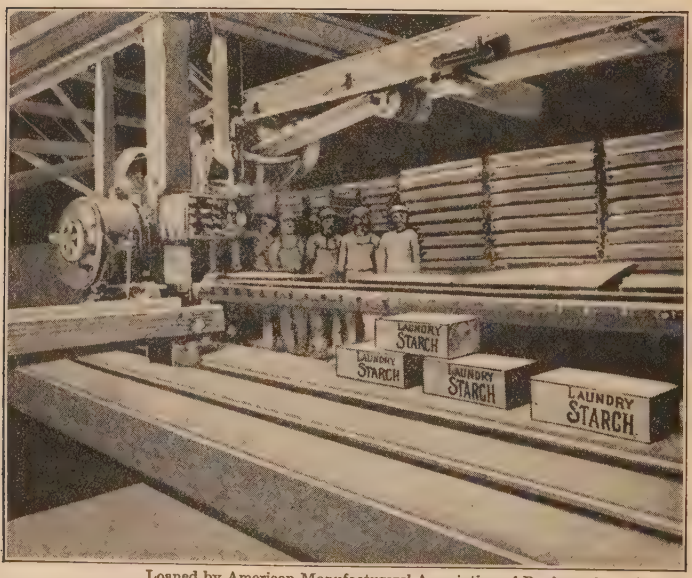
Copyright by Keystone View Co.

Here the corn is being cut, after which it is sent up the pipe leading into the top of the silo by means of a blower

Besides using large quantities for food we have other valuable products derived from corn, as follows: Glucose is a white, sweet substance of about half the sweetness of cane sugar, and is used to mix with table sirup, jam, and jellies. It is also used by manufacturers in making candy and chewing gum. Dextrine is a soluble, gummy substance made from the cornstarch, and is used by fine fabric workers, confectioners, and apothecaries. One of the most valuable by-products, however, is cornstarch, from which glucose and dextrine are made. It is used to a great extent in cooking, and

every mother in the home knows the value of cornstarch in preparing many dishes for the table, and in laundering the linen for the family. Textile manufacturers use it for the dressing and finishing of many textiles, and especially as a thickening material in calico printing. It is used by other manufacturers in making baking powder, face powder, candies, and even paper.

Oils of various kinds are also made from corn. We have machine oils, cylinder oils, toilet soap, shaving soap, axle grease, laundry soaps, and table oils, many of these oils being made by mixing the corn products with other oils. It is likewise



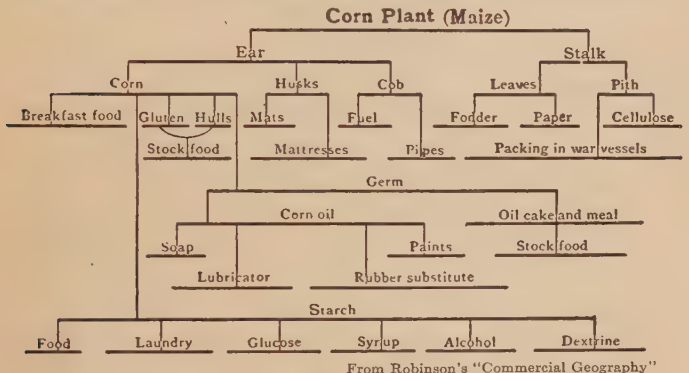
Loaned by American Manufacturers' Association of Products from Corn

Section of a starch-packing room in a corn-products manufactory

used by paint manufacturers and leather dressers.

From the cob we have cob meal, a stock food; burned cobs that make what is known as bone food for hogs; cob pipes (Missouri is the cob-pipe state of the Union); cob sidewalks, which are superior to cinder walks, and were first used in Iowa; and, lastly, the cob used for fuel.

From husks and stalk we have many by-products. Cellulose is used in the arts and also as a padding



From Robinson's "Commercial Geography"

The industrial uses of the corn plant

for ships; glue is made from the stalk juice by mixing with other materials; a fundamental element in the manufacture of dynamite, husks for mattresses, corn hats, and husks and silks used in manufacturing dolls are some of the by-products. In addition to these by-products, there is another that is becoming more and more valuable as a commercial article, and that is paper, three grades of which are made from the corn plant.

These are many of the more important uses to

which we are putting the corn plant. But many of these by-products in turn give rise to a second series of most interesting products. For example, corn oil, vulcanized, forms the basis of a substitute for rubber, and when it is compounded with sixty per cent of India rubber it is used in the manufacture of rubber boots, linoleum, wheel tires, blankets, and other articles. Crude corn oil has been used in the manufacture of toilet soap; in its purified form it is as clear as alcohol, and is then used as the basis of a substitute for olive oil. The porosity of the corn stalk pith adapts it for sheathing between the walls of battle ships, so that if the armor is penetrated this pith swells and automatically closes the leak.

The Corn Kitchen at the Paris Exposition. Before 1900 Indian corn was not eaten to any great extent by Europeans outside of Italy and Portugal. But during the World's Exposition at Paris in that year, Mr. Charles R. Dodge, one of the United States directors, was in charge of a maize kitchen, the purpose of which was to prepare and serve free of charge all the dishes made from corn that were used by the Americans at home, and to exhibit the corn products manufactured in America. Some of the dishes served were as follows: the different corn soups; yellow and white corn-meal mush; hominy grits; hominy in cream; hominy *au gratin;* all kinds of corn fritters from yellow, white, and sweet corn; the different griddle cakes with maple sirup; frumentum pudding; maizena *blanc mange;* corn muffins; corn

bread, both yellow and white; Boston brown bread; and pop corn.

This kitchen attracted thousands of people and fed hundreds daily. As the visitors inspected the corn products and the cooking they observed a case not more than three feet square and six feet high in which were samples of the more important products of Indian corn. In that collection the traveler saw corn meal (yellow and white), pearl hominy, hulled corn, cream of maize, granulated corn meal, canned green corn, canned hulled corn, maizena, samp, degerminated samp, cream meal, self-raising pancake flour, quick malt, brewer's grits, husks for mattresses, cellulose made of pith for packing the coffer dams of battle ships, paper stock prepared from shells of the corn stalk, degerminated brewers' meal, Bourbon whisky, alcohol, bolted corn meal, hulled corn meal, feed from ground corn blades and stalks and cobs, varnish, cob pipes, lager beer, fancy table sirup, pop corn, table grits, British gum, salves, laundry starch, vulcanized corn oil, oil cake, grape sugar, gluten feed, glucose, confectioners' crystal glucose, and confectioners' paste.

The products of Indian corn made a beautiful display, and that one small collective exhibit was a most interesting and inviting study to all who came to Paris to gaze upon the wonders of the World's Fair. Visitors from every nation entered and were fed on the products of Indian corn. Russian and Roumanian cooks were taught how to prepare the

food. The Vegetarian Club of France sent cooks to this kitchen to be taught how to use the Indian corn, and before the close of the Exposition one famous restaurant in Paris advertised that dishes from Indian corn could be obtained at that place.

When these foods were compared with *polenta*, the Italian dish made from corn, the natives from that peninsula were astonished, and Italian women came to learn how the American foods were prepared. One great difficulty, however, in popularizing corn foods in many parts of Europe was to be found in the equipment of the family kitchen. What little cooking was done in the house was accomplished as a rule on a small oil or gas stove, while the bread was usually prepared at the public bakery. Corn foods at their best must be served hot, and in most countries this required a considerable change in domestic habits.

Corn as a Food for Man. The importance of corn as a table food is seen in the fact that almost every cook book and journal of cooking contains recipes for corn dishes, while several such books are devoted exclusively to corn and corn products. The food value, however, of any product depends in the main upon four nutritious elements: (1) protein or nitrogenous material; (2) fat; (3) carbohydrates, including starches and sugar; and (4) mineral matter or ash.

The two functions of the food are to furnish material for the building up and repair of body tissue and to supply energy for muscular work and

body heat. Only protein can serve for the necessary tissue building. Therefore, this is usually considered its main function, while the fats and carbohydrates are relied on to furnish most of the energy.

When we compare this cereal with the others in use by civilized man we find that it does not contain as much protein as wheat, oats, or barley. But, as may be seen in the following table, it contains a greater amount of fat than any other cereal except oats. In starch and sugar, the leading elements of carbohydrates, it is about equal to wheat flour.

COMPOSITION OF CEREALS

	PROTEIN	FAT	STARCH	MINERAL MATTER	WATER
	%	%	%	%	%
Corn meal	8.9	2.2	75.1	0.9	12.9
Oatmeal	15.6	7.3	68.0	1.9	7.2
Wheat flour	10.4	1.0	75.6	0.5	12.5
Pearl barley	9.3	1.0	77.6	1.3	10.8
Rye meal	7.1	0.9	78.5	0.8	17.7
Rice	7.8	0.4	79.4	0.4	12.4
Buckwheat flour	6.1	1.0	77.2	1.4	14.3

Adapted from Pearl L. Bailey's "Domestic Science Principles and Application"

The real value of any food, however, depends not only upon the amount of nutrients which it supplies but also on the proportion of these nutrients which the digestive organs can assimilate. Investigation shows that there is little difference between Indian corn and wheat in this respect.

A Comparison. We have come at last to the end of the story. By comparing the conditions in Europe when Columbus discovered America, as described in the first part of the book, with the conditions to-day, we can see how man's knowledge

has increased and how the world has progressed. When the Indian planted his corn he punched a hole in the ground with a stick and kept the beasts and birds away until it was ready for the harvest. The system of farming then in use in Europe was only a little superior to that of the Indians. As knowledge increased, however, and man began to understand something of the force that worked in the soil, he studied the little roots as they crept around in the darkness of the earth beneath. He learned to care for them, just as he cared for the domestic animals around the home; and as they sent up a fuller life to the plants above he saw his food increasing some forty, some sixty, and some even an hundred fold.

As man's intelligence increased he threw the old

Photograph by E. J. Hall

The modern corn planter. It was a long step from the laborious task of planting each grain of corn by hand to this swift and easy method

stick away, and to-day we have great machines that tear up the earth, plant the grain, and harvest the

food. The little stone mortars in which the Indians ground their grain are kept as relics in museums, while great factories, much larger than Indian villages, and giving work to more men than were

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Harvesting and loading silage corn

found in the leading Indian tribes, to-day handle millions of bushels of grain and grind many millions of barrels of foodstuff annually.

When Columbus discovered America there were very few roads in Europe over which wagons or carriages could pass. Four or six horses tugged away sometimes at the king's carriage, and footmen followed along to lift it out of holes and bogs and to protect the royal family as it passed from town to town. Foodstuffs, therefore, could not be

transported any great distance. But to-day the fine macadam roads, the swift-moving palace trains, and the long line of freight trains tell of the progress of the world and the victory of mind over natural obstacles.

When Columbus saw those patches of Indian corn growing on the Island of Haiti, he could not of course foresee that within four centuries this new grain would become the basis of the wealth and prosperity of America, and necessary to the protection of the world against famine and pestilence. However, in 1892, four hundred years after the discovery of America, the nations of the world came together in Chicago to celebrate that important event. When Columbus's three frail vessels first sighted this new world wheat was the leading food, famine and pestilence made periodical visits and claimed a large per cent of the inhabitants of the world. But four hundred years later, when the mighty war vessels of Europe, larger than small islands, and the mammoth steamboats crowded with thousands of visitors on their way to the World's Fair, came to America to celebrate the fourth centennial of the discovery of this new land, Indian corn had made the new continent richer than the fabled cities of mythology, and had driven famine from the civilized world.

Such are the mighty changes that have taken place within these four centuries. The forces of nature, however, are still the same, yesterday, to-day, and forever. It is man that has changed, not nature.

Steam had the same elastic force, electricity the same voltage, the soil the same life-giving power, in the days of Moses and Ulysses that they have to-day. But mind has developed; and as the intelligence works upward it draws man away from the habits of the brute, giving him a larger understanding and a clearer insight into many natural forces operating unceasingly for the betterment of humanity.

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